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SPACE AGE AGRICULTURE

A Resource Book for Teachers

Division 3, Social Studies

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ALBERTA AGRICULTURE

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INTRODUCTION

Welcome to Space Age Agriculture. In writing this booklet I aimed to provide lessons that you can fit into your everyday teaching. The procedures are intended to be clear and detailed enough that you can use them directly if you wish. At the same time they are only suggestions, and I hope you will feel free to adapt and modify them to suit your needs and your students interests.

This booklet deals particularly with Social Studies at the junior high level. It is part of a three book set. The other Division 3 volumes were prepared for Science and for the Agriculture option. Each book in the set aims to show users that:

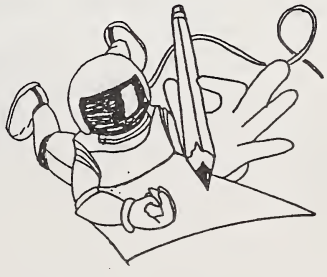
. agriculture is affected by each school subject area, and

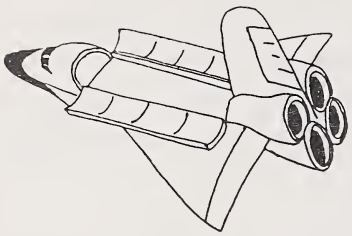
. agriculture is a diverse endeavour that affects even the most urban Albertans.

Agriculture in the Classroom booklets at all grade levels are written to teachers like yourself. Space Age Agriculture is no exception. Throughout the book however there are certain specialty pages that are identified graphically.

Pages marked with this symbol are extended references for you. In classroom explorations you provide ground control, monitoring student effort and guiding students back to earth.

This symbol indicates a student task sheet. Your students act as astronauts exploring the intellectual space and recording their findings.





Pages with this symbol are student resource sheets. They contain information directly useful to the work required by task sheets.

In Space Age Agriculture we have continued to aim for direct links with the Alberta school curriculum. In this case, our focus is the 1987 revision of the Program of Studies for Division 3 Social Studies. Each lesson includes a description of what social studies unit it supports, and what concepts it reinforces within that unit. You will find that we have directly dealt with two units:

Grade 8, Topic C - Latin America: A Case Study of Brazil
Grade 9, Topic A - Canada: Industrial Development

Feel free to apply the ideas here to topics in other units.

This is the pilot edition of Space Age Agriculture. Throughout this year we will be seeking your feedback regarding how lessons work, what modifications you try, where you need expansion or contraction, and any of your other responses. Through this process we hope to produce a resource that any teacher can use effectively in a classroom.

Alberta Agriculture film library or publications library may have some additional relevant resources. We encourage you to write for a publication list and film catalogue. There are available from:

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TABLE OF CONTENTS

UNIT I: AGRICULTURE IN CANADA AND BRAZIL

Activity 1: Eat Like a Brazilian 1.1

Students prepare and taste some traditional Brazilian foods.

Activity 2: And Keep the Change 2.1

Students plan the purchase of food for a week on a low and fixed income in Brazil and Canada.

Activity 3: Pioneering in Brazil 3.1

Students role play the settlement history of Brazil.

Activity 4: Bringing it all Together 4.1

Students summarize their knowledge about food in Brazil and make predictions for the future.

UNIT II: HOW NEWS MEDIA DEAL WITH AGRICULTURE

Activity 5: Agriculture in the News 5.1

Students collect newspaper articles about agriculture and classify them based on the sector discussed.

Activity 6: Current Issues in Agriculture 6.1

Students identify major agricultural issues discussed in newspapers.

UNIT III: SOCIAL GOALS AND AGRICULTURE

Activity 7: So Just What Do We Want? 7.1

Students identify the philosophical background for contemporary arguments about qualify of life.

Activity 8: Choices for Agriculture 8.1

Students discover and use the vocabulary of some alternative farming methods.

Activity 9: The Farming Game 9.1

Students work through several farm production decisions to show the effects of alternative production strategies.

UNIT IV: DIFFERENTIATION OF ROLE IN AGRICULTURE

Activity 10: John Henry in Food Production 10.1

Students demonstrate the effect of mechanizing food production on society at large.

Activity 11: Canadian History of Mechanization 11.1

Students relate their discoveries in Activity 10 to Canadian statistics on food production and mechanization.

Activity 12: Changing Food and Creating Food 12.1

Students prepare several different orange drinks and compare them for flavour and cost per unit of vitamin C.

UNIT V: ENTREPRENEURSHIP

Activity 13: Starting New Businesses in Agriculture . . . 13.1

Students review case histories of the start up of two agricultural businesses and identify attitudes common to founders.

Activity 14: Seeing With Eyes of Enterprise 14.1

Students redefine problems as situations needing attention.

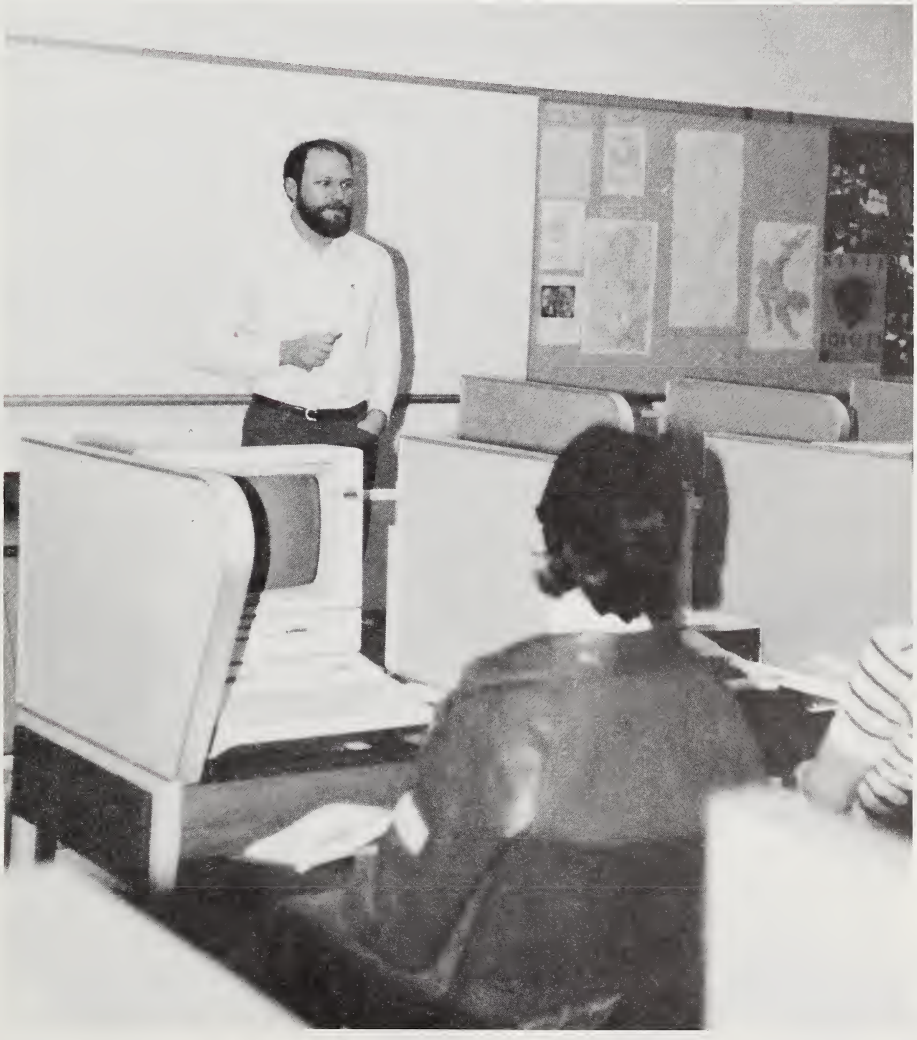
Activity 15: Vegetable Glitz: Beyond Fibre and Vitamins . .15.1

Students develop a marketing scheme for imaginary products derived from vegetables.

UNIT VI: INTERNATIONAL TRADE

Activity 16: The World Trading Game 16.1

Students trade commodities in behalf of various countries.



Unit I: Agriculture in Canada and Brazil

In this unit you and your students will consider Brazil and some important aspects of its food production and distribution system. The unit includes four fully developed lesson plans, any of which can serve as a springboard to further activity.

Activity 1 is an enrichment experience, and would make an excellent start to a unit on Brazil. It was written to demonstrate the preparation as well as the taste of Brazilian food. Students working on the first two recipes will gain an understanding of the labor behind traditional food made in traditional ways. The later recipes provide the taste of Brazilian food.

In Activity 2, your students will see how food prices in Brazil compare with those in Canada. The problems of a society with a large percentage of its people living in poverty will become obvious during this exercise.

Activity 3 allows your students to re-enact on a short time scale the economic history of Brazil. As a result, they will better understand how present day Brazilian society developed.

Activity 4 is an opportunity for students to review and organize their knowledge and ideas about Brazil. Your students will complete a matrix chart of past and present conditions in Brazil. Based on the result, they will predict how each aspect of Brazilian life will develop.

Activity 1

EAT LIKE A BRAZILIAN

Objectives: A nation's foods provide an easy approach to many aspects of its culture. In this activity, by preparing and tasting several native foods of Brazil, your students can begin to gain an appreciation of how the founding cultural groups contributed to modern Brazilian society.

Curriculum Fit: Grade 8, Topic C
Latin America: A Case Study of Brazil

Lesson Concepts: Cultural influences on the Brazilian diet

Agriculture Concepts: Diversity of agriculture
Economic importance of agriculture

Cognitive Level: Comprehension

Materials Required:
glasses or cups
small plates
forks
hammer
ice pick or suitable substitute
fine mesh strainer
several mixing bowls
3 - 4 litre saucepan
12 inch skillet
materials for straining cassava
mortar and pestal for grinding
grater
1 package of tapioca
3 coconuts
2 litres of milk
ingredients listed in Recipes 1 - 5

Time Required: Two 40 minute periods

BACKGROUND - For the Teacher

The Brazilian Diet

Brazilian diets are extremely varied and reflect the diverse cultures which make up the population of the country. In recent times a growing middle class, exposed to advertising and strong American influences is becoming increasingly accustomed to preprocessed and packaged food, "fast foods", and international cuisine. Most of the population however, enjoys native Brazilian foods at some time during the week. For many, locally produced foods are all they can obtain or afford. All too often in Brazil, the real currency is food of one kind or another.

Cultural Influences

Brazil was originally colonized by the Portuguese. As a result, much of the Brazilian tradition includes the Portuguese taste for fish and seafood which was easily obtained and could be dried for preservation. In present day Brazil, the amount and type of fish or meat in the diet is determined by income, location, and class.

Seafood and beef was often combined with locally grown manioc, corn, sweet potatoes, bananas, or peanuts. These crops are native to Brazil and were first gathered or cultivated by the Indians. The common present day staples are rice, black beans, and manioc meal.

A unique character is given to the food of central Brazil by the special spices and oils used in Bahian cooking. The Bahians arrived as Negro slaves imported by the Portuguese from West Africa to work the farms and to do household chores.

Later immigrants brought eating customs from many cultures but the early arrivals determined the character of the traditional Brazilian menu.

Food Preparation in Brazil

In Brazil, the majority of the population buys its fresh produce daily as required. Imagine how you would preserve food in your own homes without a refrigerator and without expensive canned goods.

Through the elaborate process of straining and grinding of the "Cassava root" for manioc meal of the extraction and preparation of coconut milk, we can appreciate the effort that is required in the preparation of foods from fresh agricultural products. It is no surprise that the modern Brazilian will purchase manioc flour or freshly ground coconut and milk from a market vendor or a modern supermarket. Food services industries in all cultures begin through the desire for these services among people who can afford them.

Manioc root is a staple in much of rural Brazil and many other tropical third world countries. The advantages of this starchy tuberous root are that it stores well in the ground and grows in even poor soil. However, it requires considerable preparation before it can be eaten, and it is bland and poor in nutritional value.

There are two major types of manioc. The first is a starchy and rather tasteless type which must be boiled for several hours before it is soft enough to eat. This type is also known as yuca or sweet manioc.

The second type is the bitter cassava root. Careful preparation is required since this root contains a deadly poison called hydrocyanic acid. Determined Amazonian Indians developed clever methods to remove the poison. These methods are still used in a mechanized form today. Pulverized cassava root is enclosed in a basket. Weights are fastened in such a way as to apply pressure to the contents so that the liquid is forced out. This liquid is poisonous unless boiled, after which, it may be used as a sauce.

Cassava is used to make a flour called farinha found in a variety of baked foods. Farinha is also kept in a shaker on the table and added to moist foods as a thickener or filler.

In Canada, farinha occurs as tapioca which can be obtained from the shelves of the local grocery. Tapioca is made by forcing moist farinha through a mesh to produce round pellets. Regrinding tapioca or manioc meal with a mortar will demonstrate the process by which farinha is made and will also produce farinha for table use.

The following recipes will provide the class with a range of different taste experiences! The main dish is a spicy seafood which may be eaten with either of the Recipe 3 or Recipe 4 dishes. Fresh coconut is used to provide an experience in basic food preparation, without the advantages of prepackaged processed foods.

PROCEDURE

Part 1

Introduction:

1. Briefly describe food in Brazil.
2. Divide the class into three groups.
3. Ensure that each group has a coconut, a supply of tapioca and a mortar and pestle.

Part 2a

The Activity, Day 1:

4. Each group of students should:
   - grind their tapioca into flour using the mortar and pestle.
   - prepare grated coconut according to Recipe 1.
   - prepare coconut milk according to Recipe 2.
   - set aside the grated coconut and coconut milk for the next day's cooking.

Part 2b

The Activity, Day 2:

5. On the second day, assign one of Recipes 3, 4, and 5 to each of the groups.

Part 3

Conclusion:

6. When all the dishes are cooked, encourage students to taste them and rate their flavor on the chart contained at the end of this lesson plan.
7. Ask the students which dishes would be popular in their families and how often any of them could be served.

FOR DISCUSSION

1. How would your daily life change is someone in your family had to grind grain and bake bread for every day (or every meal)?
2. Who would do this work in your family? How would this be decided?

RELATED ACTIVITIES

1. Have the students investigate what native Alberta plants might provide the basis for a powdered or ground starch food.

2. Have students determine ways that some starch yielding, native Alberta plant could be gathered and processed into a flour substitute.

References:

All recipes taken from:

Leonard, Jonathan. Latin American Cooking. Time-Life Books. 1971.

RECIPE 1

Freshly Ground Coconut (Coco Rallado)

Coconuts are not native to Brazil. They were most likely imported from Africa, but are now found along the coast and are used in many ways. Coconuts are available in Canada with the peak season usually around February. When buying a coconut, be sure that it is full of milk and has a good hard brown shell.

Recipe: to make about 6 cups

2 fresh coconuts (2 pounds each)

Procedure:

To remove the milk, puncture two of the three eyes at end of the coconut with an ice pick and drain the contents into a measuring cup.

The shell is much easier to separate from the meat if the coconut is first heated in an oven at 400°F. for 15 minutes. Then, while the shell is still hot, strike the coconut firmly with a hammer until the shell falls away. You will then be able to remove the inner skin with a potato peeler.

Next, cut the coconut meat into small pieces for grating with a hand grater or electric blender.

Stir the coconut milk into the grated mixture.

RECIPE 2

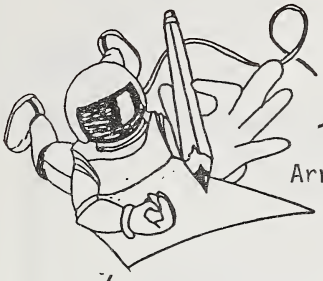
COCONUT MILK (Leche do Coc)

Recipe: to make about 2 cups

2 cups fresh milk (or water)
freshly grated coconut (from Recipe 1)

Procedure:

Heat milk or water without bringing to a boil. Place the finely grated coconut from Recipe 1 in a fine strainer. Pour the hot milk over the coconut and allow to drain undisturbed into a mixing bowl for 10 minutes. Press the remaining coconut with a spoon to remove all of the liquid before discarding the coconut. Store refrigerated.



RECIPE 3

Arroz Brazieiro (Rice with tomato sauce and onion)

1/4 cup olive oil
1 large cooking onion
3 cups long grain rice
3 cups chicken stock
3 cups water
2 whole, skinned, chopped, unseeded tomatoes
1 tsp. salt

Procedure:

Heat oil for 30 seconds in a 3 quart saucepan over medium heat. Add onion and cook until transparent. Pour in rice and stir until all grains are covered in oil. Do not brown rice. Add stock, water, tomatoes. Reduce heat to low and simmer for 20 minutes or until all water is absorbed by the rice. Keep warm in oven until required.

RECIPE 4

Pirao de Arroz com Leite do Coco (rice and coconut-milk pudding)

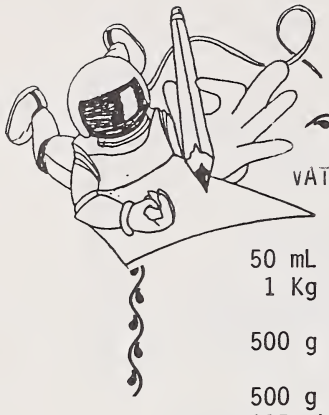
Recipe: to make 6 servings

4 cups coconut milk (from above)
3/4 cup rice flour
1 tsp. salt

Procedure:

Scald 3 cups coconut milk in a saucepan. Mix the remaining cup of milk with the rice flour and salt in a small bowl. Reduce the heat. Add the flour and water mixture and stir until the mixture thickens slightly. Pour into lightly buttered custard molds (or a cupcake tray). Chill until firm.

To remove the custard, heat the pan in hot water for a few seconds and run a small knife around the inside of the mold.



RECIPE 5

VATAPA (Fish and Shrimp in ginger-flavored peanut sauce.)
Recipe: makes 6 to 8 servings

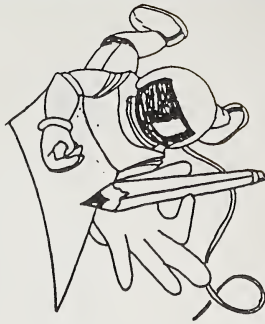
50 mL	oil	1/4 cup
1 Kg	seabass fillets*, cut in 5 cm (2 inch) pieces	2 pounds
500 g	halibut fillets*, cut in 5 cm (2 inch) pieces	1 pound
500 g	raw shrimp, shelled and de-veined	1 pound
125 mL	finely chopped onion	1/4 cup
2	medium tomatoes, peeled, seeded and chopped	2
1	canned hot pepper drained, seeded and finely chopped	1
1	coconut, freshly grated OR 625 mL (1 1/2 cups) flaked coconut	1
625 mL	water or milk	1 1/2 cups
50 mL	crushed, dry roasted peanuts	1/4 cup
50 mL	ground canned shrimp	1/4 cup
15 mL	finely chopped fresh coriander OR 5 mL (1 teaspoon) ground	1 tablespoon
15 mL	finely grated fresh ginger OR 5 mL (1 teaspoon) ground	1 tablespoon
5 mL	salt	1 teaspoon
	freshly ground pepper	
15 mL	rice flour	1 tablespoon
25 mL	cold water	2 tablespoons
1 mL	paprika (optional)	1/4 teaspoon

Procedure:

Heat oil in large fry pan. Arrange fillets and shrimp in single layer and cook over medium heat, 3 to 4 minutes per side, until lightly browned. Transfer to plate. Repeat, until all seafood is cooked. Set aside.

Add onions to remaining oil and saute until onion is transparent. Add tomatoes and hot pepper. Reduce heat and cook covered 10 minutes. Add coconut, water or milk, peanuts, canned shrimp, coriander, ginger, and salt. Ground pepper to taste. Bring to boil, reduce heat and simmer, covered 15 minutes. Combine rice flour and water and add to mixture. Stir and cook until smooth and thick.

Strain the sauce through a fine sieve into a large bowl. Force all liquid from contents by pressing down hard with the back of a spoon before discarding contents. Return strained sauce to pan. Add paprika if desired. Stir and cook over moderate heat until sauce coats a metal spoon (about 3 minutes). Add the fish and shrimp and simmer 2 to 3 minutes until heated through. Transfer to large heated serving platter and serve immediately. (* substitute any combination of firm white fish.)

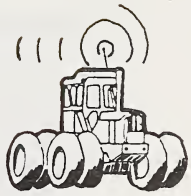


PRODUCT _____ DATE _____

In the order in which they are presented, taste each sample and mark the number of the "face" which best describes your feeling about each of the characteristics listed.

SAMPLE NUMBER	COLORS	FLAVOUR	TEXTURE	WHICH CHARACTERISTIC WOULD YOU MOST LIKE TO SEE IMPROVED

Activity 2



FOOD COSTS IN CANADA AND BRAZIL

Objectives:	Food prices are an important consideration in both Brazil and Canada. In this activity your students will attempt to buy a one week supply of food for a family on a low and fixed income in either Brazil or Canada.
Curriculum Fit:	Grade 8, Topic C Latin America: A Case Study of Brazil
Lesson Concepts:	Inflation, Devaluation Effects of economic policy on citizens How people live in Brazil
Agriculture Concepts:	Diversity of agriculture Economic importance of agriculture
Cognitive Level:	Comprehension, Application
Materials Required:	Photocopies of data sheets included here
Time Required:	Two 40 minute class periods

BACKGROUND - For the Teacher

Incomes vary greatly between different regions of Brazil, but the price of food generally does not. There are exceptions, like cheaper seafood near the coast, less expensive beef in the interior, or garden produce which costs only one's labor. But for Brazilians, just as for Canadians, the great equalizer is food. We can do without many things in life but food is essential.

In a country of 138 million inhabitants, almost 20 million people work for less than the equivalent of $60.00 per month in 1987. Many of these people have almost no income at all and must survive on what they can grow on someone else's land or what they can scavenge. Housing is often obtained in crowded urban slums in which over 25% of the population lives, or by squatting on unused rural land.

We can see a similar problem in Canada. Many people on pensions or social assistance earn less than $300.00 per month and in our cold climate, at least half of this is necessary to provide shelter.

Inflation during the 1980's reached as high as 200% in Brazil. This meant that the cost of food increased so rapidly that what you could buy today might be out of reach tomorrow. Increased wages would usually follow, but more slowly. Barter or labor in exchange for food replaced currency among the lower classes. Both make an absolute value of food difficult to determine. Barter in exchange for food is not as common in Canada.

The unit of Currency in Brazil is the Cruzeiro (or lately, the Cruzado). The following exchange rates existed in the early 1980's.

Number of Cruzeiros for One Canadian Dollar

1980	1981	1982	1987
55.37	108.38	205.77	44.15

Although inflation in Canada was about 8% during the same period, we can see inflation was much higher in Brazil. It took almost 4 times as many cruzeiros to obtain one Canadian dollar in 1982 as it had in 1980.

By 1983, the problem of inflation was so severe that the government of Brazil decided to reduce the exchange rate for the cruzeiro by decree. This is called revaluation and it means that each cruzeiro is worth more dollars. However, the cruzeiro becomes much harder for people to get. Since this major 1983 revaluation, the Brazilian government has repeated the process several times. During the most recent revaluation, they renamed the basic currency the Cruzado. As a result of these events, in October of 1987, one Canadian dollar will buy 44.15 Cruzados.

Regardless of currency or its value, food is an important purchase. When people cannot buy very much food, then the nutritional value of what they do buy becomes very important.

Some people do not get enough food energy to keep them alive; this is starvation. However, even with a full stomach, serious health problems and even death can occur if essential elements are not included in the diet, this is malnutrition. Some of the most serious forms of malnutrition are:

Kwashiorkor - a wasting disease caused from a lack of amino acids found in milk, fish, beans, and nuts. This condition is common in Africa, Asia, and parts of South America. Symptoms include fluid build up in tissues, a scaly skin rash, and liver damage.

Rickets - causes soft deformed bones in children from a lack of Vitamin D.

Beri-beri - affects the heart, circulatory system, and the brain, and is caused by too little thiamin (Vitamin B) which we normally obtain from vegetables.

Pellegra - dermatitis, diarrhea, mental breakdown, and death may occur from a lack of niacin which is usually found in brown rice, beans, fish, and rice.

General symptoms of malnutrition include a lower activity level, inefficiency, and a lack of alertness, endurance, creativity, and initiative. Permanent organ and brain damage often result.

PROCEDURE

Part 1

Introduction:

1. Explain to the class that they will be considering how food costs in Canada compare with Brazil and some of the changes that have occurred in Brazil's economy during the 1980's.

2. Divide the class into six groups. Three groups will represent families in Brazil; the other three, families in Canada.

Part 2

The Activity: Historical Perspective

3. Assign one of the Brazil groups 1650 cruzeiros to buy food for one week from the 1981 shopping list provided. The remaining groups receive 1100 and 550 cruzeiros respectively. Assign the three Canadian groups $60.00, $40.00. and $20.00 respectively for their weekly food budget. This money should be spent evenly over the four major food groups.

4. Tell your students that, in spending their money, they should:

   - decide on what they need for the week
   - add up the total cost
   - subtract all or part of some items if they have spent too much
   - recalculate their total cost

   They must repeat this process until they have managed to plan a diet within your budget.

5. Ask all groups to repeat steps 3 and 4 using the 1982 price lists for Brazil and Canada, but the same incomes.

Part 3

The Activity: Present Situations

6. Tell your students about the 1983 revaluation of currency. Ask them to consider the question "If the cruzado in 1987 is five times as valuable as the cruziero in 1982, but people can only get one-fifth as many, then how have things changed for those people.

Part 4

Conclusion:

7. Ask students to suggest ways that the real cost of buying food can be reduced in either Brazil or Canada.

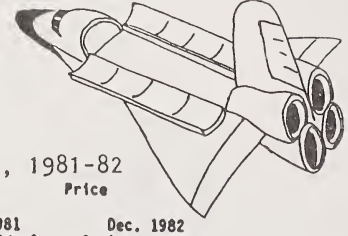
FOR DISCUSSION

After groups have planned their diet, answer or discuss the following:

1. What was the most expensive food group?
2. What items will you do without in order to feed your family?
3. What food groups will form the bulk of your diet?
4. What nutritional deficiencies would be found in each group?
5. How could you add to your food supply with no increase in income?
6. Was there a great difference in food prices between Canada and Brazil? Provide examples to support your answer.
7. Give examples of a price increase which is greater than inflation from both countries. What might be the cause of such a price change?
8. Why are a greater variety of units used when reporting Canadian statistics as compared to Brazil?

RELATED ACTIVITIES

1. Have students find out current retail prices for the Canadian foods on Data Sheet 2.
2. Have students use the 1987 exchange rate and the current prices for Canadian foods to calculate prices for comparable Brazilian foods on Data Sheet 1.



FOOD PRICES IN CANADA, 1981-82

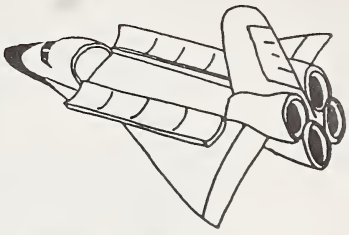
Products	Units	Price Dec, 1981 Cdn $	Dec.1982 Cdn $
Milk, fresh	1 litre	0.72	.79
Evaporated milk	385 ml. can	0.65	.76
Powdered milk	1.5 kg. box	6.45	7.62
Ice cream	2 litre	2.37	
Butter	1 lb.	2.01	2.24
Cheese (processed)	250 gm.	1.58	1.78
Eggs, large	Doz.	1.27	1.33
Sirloin steak	lb.		4.19
Round steak	lb.	2.97	2.83
Prime rib roast	lb.	3.08	3.26
Blade roast, blade out	lb.	1.90	
Blade roast, blade in	lb.	1.56	1.60
Stewing beef	lb	2.12	2.36
Ground beef regular	lb.	1.34	1.42
Pork, centre cut chops	lb.	2.59	3.29
Pork, boneless butt roast	lb.	1.68	2.39
Bacon	500 gms.	2.52	3.81
Wieners	lb.	1.65	2.25
Chicken	lb.	1.59	1.65
Salmon	lb.	2.51	2.55
Shortening	lb.	1.01	1.14
Flour	2.5 kg.	2.72	2.83
Corn flakes	675 gm. box	1.69	1.85
Macaroni	500 gms	0.85	0.95
Bread store brands (3)	675 gm. loaf	0.86	0.97
Soda crakers	450 gm box	1.29	1.43
Sugar	2 kg bag	2.04	1.87
Oranges	lb.	0.51	0.93
Grapefruit	lb.	0.37	0.52
Bananas	lb	0.64	0.47
Potatoes	10 lb. bag	2.32	2.13
Onions	lb.	0.47	0.46
Carrots	lb.	0.39	0.35
Cabbage	lb.	0.33	0.23
Celery	lb.	0.50	0.60
Lettuce	lb.	0.71	0.68
Orange juice	48 fl oz can		1.89
Tomatoe juice	48 fl oz can	1.29	1.51
Tomatoes, canned	28 fl oz can	1.12	1.41
Infants' food	4 1/2 jar	0.37	0.41
Beans with Pork	14 fl oz can	0.66	0.95
Soup (vegetable)	10 fl oz can	0.42	0.47
Tea (60)	8 oz.	2.23	2.21
Coffee, regular	1 lb. bag	3.00	3.23
Coffee, instant	10 oz	6.40	6.67

Sources: Consumers Price Index - Statistics Canada

FOOD PRICES IN BRAZIL, 1981-82

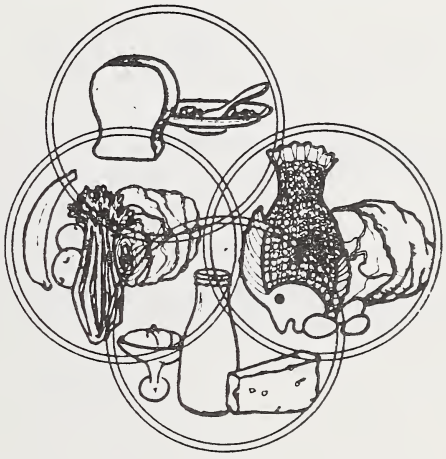
Product	Units	Price Dec. 1981 Cr $	Dec. 1981 Cdn $	Dec. 1982 Cr $	Dec. 1982 Cdn $
Milk - condensed	400g	119.31	1.10	212.47	1.03
Milk - powdered	454g	242.38	2.23	492.83	2.40
Milk - fresh	litre	40.00	0.36	79.00	0.38
Butter	kg.	305.36	2.82	1175.00	5.71
Margerine	kg.	217.78	2.01	417.90	2.03
Processed cheese	Doz.	527.33	4.87	326.54	1.58
Eggs	Doz.	95.50	0.88	159.78	0.78
Oxen (meat) Grade A	kg.	308.69	2.84	658.23	3.19
Oxen (meat) Grade B	kg.	217.00	2.00	441.53	2.15
Pork (meat)	kg.	286.59	2.64	675.08	3.28
Beef (dried)	kg.	401.81	3.71	761.61	3.70
Chicken - dressed	kg.	167.04	1.54	321.36	1.56
Salt	kg.	25.11	0.23	44.75	0.21
Salt Cod	kg.	1044.12	9.63	3307.14	16.07
Fresh Fish	Doz.	354.16	3.27	710.00	3.45
Almond Oil	kg.	102.80	0.95	194.00	0.94
Corn Oil	kg.	151.39	1.39	302.84	1.46
Soya Oil	kg.	161.21	1.48	298.14	1.45
Olive Oil	kg.	468.00	4.32	945.52	4.59
Lard	kg.	119.00	1.10	282.00	1.37
Wheat Flour	kg.	33.19	0.31	82.74	0.40
Corn Meal	kg.	45.10	0.42	64.92	0.32
Kidney Beans - black	kg.	139.92	1.29	116.77	0.57
Kidney Beans-common	kg.	128.60	1.19	93.14	0.45
Macaroni	kg.	73.73	0.18	143.13	0.70
Spaghetti Noodles	kg.	108.46	1.00	180.71	0.88
Bread	kg.	100.00	0.92	240.00	1.16
Rice	kg.	74.33	0.67	153.96	0.74
Refine Sugar	kg.	66.84	0.61	138.83	0.67
Sweet Manioc	kg.	39.00	0.36	50.22	0.24
Squash	kg.	39.70	0.37	56.14	0.27
Potatoes	kg.	55.32	0.51	79.20	0.38
Onions	kg.	65.68	0.61	142.06	0.69
Oranges	Doz.	66.11	0.61	121.56	0.59
Guiava	kg.	106.44	0.98	206.80	1.00
Bananas	Doz.	81.55	0.75	107.80	0.51
Tomatoes	kg.	52.42	0.48	174.00	0.84
Coffee	kg.	392.62	3.62	833.55	4.05
Instant Coffee	kg.			320.50	1.56
Tea	kg.	39.20	0.36	58.56	0.28
Vinegar	litre		0.55	97.83	0.42
Wine Vinegar	litre	75.49	0.70	141.20	0.67

* Sources: Anniario Estatistics de Brazil - 1983



DATA SHEET 3

FOOD GROUP	IMPORTANT SOURCES OF:
1. Dairy products and eggs	- fats, protein, and calcium
2. Cereals	- carbohydrates and protein
3. Meats	- fats and protein
4. Fruits and Vegetables	- vitamins and minerals



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Birch G.G., A.G. Cameron, and M. Spencer, Food Science. 3rd Ed. Pergamon Press, 1986.

Activity 3

PIONEERING IN BRAZIL

Objectives: In this activity students will role play the history of settlement in Brazil. Through this process, they will experience some of the causes of modern Brazil's land ownership and wealth distribution problems.

Curriculum Fit: Grade 8, Topic C
Latin America: A Case Study of Brazil

Lesson Concepts: The effect of early settlement patterns on social organization and distribution of wealth

Agriculture Concepts: Diversity of agriculture
Economic importance of agriculture

Cognitive Level: Synthesis

Materials Required: Task sheets included
Poker chips or other markers (200)
Atlas including Vegetation or Land Use in Brazil
Narrow masking tape

Time Required: One 40 minute class period

BACKGROUND - For the Teacher

The purpose of this game is to make students identify with the problems of modern Brazil. The rules to the simulation can vary from those that follow. Many can be altered for your own classroom by the autocratic "teacher" government. Explore feelings and attitudes of various roles at the end of its game.

Even in the end when democracy prevails there are problems. Where is the Middle Class? Who will lead the push for reforms? Who still owns the land and financial resources of the country?

The Early Colonial Period

The early economic history of Brazil is essentially the history of agriculture.

The small population and limited resources of Portugal limited the development of its Brazilian colony. Faced with French claims to Brazil and lacking sufficient population to settle the region, the Portuguese government gave vast land holdings to a few. Economic development was, at first, limited to cutting and export of Brazil wood to Europe.

In the 16th century, cultivation and export of sugar cane began. This created the first colonial "boom". Sugar production was most economical in large farms or plantations which required a large labor force. This led to the importation of blacks from Africa and the enslavement of the native population.

Oversupply and low prices gradually put an end to the sugar boom. Mineral exports fuelled the economy until the mid 1700's. This was followed by a period of subsistence farming and productivity aimed at Brazil's own needs.

The next boom cane with increased coffee production. By 1850, the labor shortage on the plantations was extreme. The practice of slavery was allowed to continue until 1888. Immigration from Europe increased after 1850 and brought skilled technicians and educated workers.

A minor boom in rubber production occurred in the period from 1850 to 1921. This ended due to competition from cheaper Asian sources.

The Modern Era

The beginnings of industrialization occurred from the late 19th century. The increase in gross national product has been 8% per year through the 1970's and 1980's and is among the highest in the world.

Agricultural products are a major proportion of exports. Brazil is second only to the United States in the export of food. However, feeding it's population remains a problem. Traditional food crops are

often replaced with crops for export to help pay the enormous foreign debt of recent years.

To reduce their dependance on foreign oil, 90% of all cars in Brazil are fuelled with ethanol, obtained from the distillation of sugar cane. Ten percent of Brazilian farm land is now used for sugar cane production, further reducing the acreage available to grow food for the domestic market.

Present Day Land Distribution

In 1965, it was reported that 10% of Brazil's farmers owned 70% of all agricultural lands but produced only 13% of the crops. History has encouraged the accumulation of vast landholdings and provided little incentive for intensive land use and modernization of agriculture. The pattern has been to abandon land and move farther into the frontier as soils become exhausted and yields decline.

The following statistics show that changes in land distribution (as indicated by the size of individual land holdings) has been slight in this century.

With the help of recent land reforms, 80% of the land is now owned by %5 of the people. However, land redistribution has still not occurred. Instead, new land has been provided by "slash and burn" farming methods. Areas of land twice as large as Prince Edward Island are cleared each year in the Amazon basin which is itself bigger than the entire continental U.S. After a few years of planting rice or corn, the fragile topsoil is exhausted of nutrients and begins to form a surface hardpan. The farmer must then move to new land where the process is repeated.

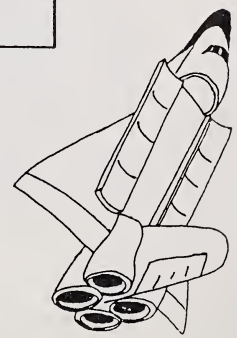
> NOTE: You may find that your students should role play the pioneering game twice before trying the discussion. This will allow rules to be learned and problems worked out.

BRAZILIAN LANDHOLDINGS, SELECTED YEARS, 1920-75
(in percentage)

SIZE (in hectares)	1920		1950		1970		1975	
	Holdings	Area	Holdings	Area	Holdings	Area	Holdings	Area
Under 10	71.6	9.0	34.4	2.3	51.2	3.1	52.2	2.8
10 to 20			16.7	2.1	15.7	3.7	14.8	3.2
20 to 50			23.7	6.5	16.8	8.6	16.3	7.8
50 to 100			10.6	6.6	6.9	8.1	6.9	7.6
100 to 1,000	24.4	27.6	13.0	32.5	8.5	37.0	8.9	35.8
1,000 to 10,000	3.8	37.4	1.5	30.7	0.8	27.2	0.9	27.7
Over 10,000	0.2	26.0	0.1	19.3	0.1	12.3	---	15.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

--- means less than 0.1 percent

* from Brazil: a Country Study, 1983



PROCEDURE

Part 1

Preparation:

1. Enlarge the outline map of Brazil to full table size.

2. Arrange the class so that the Brazil table is in the center, with desks arranged in a circle.

3. Distribute a supply of poker chips or other markers to represent units of farm land over the map of Brazil.

Part 2

Introduction:

4. Inform the students that in today's activities they will be acting out the settlement history of Brazil on a game board.

5. Assign three students to represent the native Indians. Each student can represent 5 native groups. They may occupy one square per group, may move to empty adjacent squares at will, but may not permanently fix on any square.

6. Of the students remaining, designate two-thirds to be in Europe and one-third to be in Africa. Declare that you will represent the government of Portugal, their colonial officials in Brazil and the government of Brazil as needed.

Part 3

Early Settlement:

7. As ruler of Portugal, call for European volunteers to settle Brazil. Inform the people that five will be chosen and each of them can claim as much land as possible in the time allotted, but one will die because of the harsh conditions.

8. Select from among the volunteers by lottery - all interested students draw a number, the five with the lowest numbers win.

9. Allow the five successful colonists to assemble land parcels for 4 minutes.

   a) Allow the colonists to consult the Atlas for land use or any other information while they select parcels.

b) To make a selection colonists must write their lottery number on a square of masking tape and stick it onto a chip.

c) Any native Brazilians occupying a land area claimed by a colonist must move away, toward the least settled area available.

d) After 2 minutes, collect the lottery numbers from your colonists and draw one. The colonist selected dies in a pioneering accident; you can return the student to the area representing Europe.

e) Be certain to stop the colonizing process with some of the available land unclaimed.

Part 4

The Sugar Boom:

As soon as you have ended the colonization period, your remaining colonists can begin to make money if they can put their land into sugar production.

10. Inform your colonists that you will pay 20,000 currency units for each land unit they can staff. They can gather laborers by:

a) enslaving natives at the rate of 1 group for every 2 land units.
b) enslaving Africans at the rate of 1 representative for every 2 land units.
c) hiring Europeans at the rate or 1 representative for every 3 land units.

Part 5

The Boom Busts:

11. As soon as the land is nearly fully staffed, declare the sugar boom over.

a) Stop passing out money.
b) Allow hired European laborers to claim any uncolonized land they want.

Part 6

The Coffee Boom:

12. As Ruler of Portugal announce that the rest of the students in Europe may now immigrate.

13. New European immigrants may claim any land that is not colonized or they may find jobs.

14. As Governor of Brazil, begin distributing currency units for land in production.

Part 7

Free the Slaves:

15. As Governor, declare that all slaves are free.

16. Landowners may hire freed slaves as laborers if they can agree.

    a) Laborers may be paid with pieces of currency vouchers. The size of the pieces is determined by the landowners.
    b) Laborers must be paid whenever the Governor pays for production.
    c) Laborers can by land for 1 currency voucher per unit from a willing owner whenever they collect enough pieces.

Part 8

Land Redistribution:

17. Show the location of the major cities of Brazil on the map and tell the laborers that they may move there if they wish. Any number may occupy the city space.

18. Give students moving to cities small pieces of currency vouchers, at random and in small amounts.

19. Tell the laborers and other landless that they may acquire land by any non-physical means.

20. Inform all players that if they do not have either land, work, or one-half currency unit within a minute, they will die of starvation.

Part 9

Conclusion:

At this point you will find all of the conditions in modern day Brazil developing within the classroom. Squatters will, of necessity, refuse to move from land. Cities will become overcrowded. Political groups will form without the political will to force reforms. Autocratic rule will continue to prevail.

If any worker group shows signs of gaining land by saving income, you can use inflation to wipe out savings and inflate land values. Efforts to seize land can cause individuals to disappear from the game.

FOR DISCUSSION

1. What have been the major differences in the colonization of Canada as compared with the colonization of Brazil?

   - strong central government and organized settlement
   - better transportation networks
   - smaller landholdings
   - no slavery
   - autocratic foreign control of government vs. democratic domestic control of settlement.

2. What are some similarities between early history of colonization?

   - pressure from foreign countries for rapid colonization
   - agriculture provided the incentive for colonization

3. Why is it still difficult to change the distribution of land in Brazil today?

   - the upper classes control both land and distribution of wealth in the country
   - there is only a small middle class to apply economic and political pressure for change on the society.

RELATED ACTIVITIES

1. Review the history of homesteading on Canada's prairie provinces and role play its major events.

2. Debate the resolution "Maximum freedom depends on the widest possible dispersal of ownership."

BRAZIL and neighboring South America

Activity 4

WHAT FACTS ARE BEHIND FIGURES?

Objective:	Using information from earlier lessons and from other references, students complete a matrix chart summarizing past and present conditions in Brazil and predicting how aspects of Brazilian life will develop.
Curriculum Fit:	Grade 8, Topic C Latin America: A Case Study of Brazil
Lesson Concepts:	Read and interpret charts, graphs, tables
Agriculture Concepts:	Diversity of agriculture Economic importance of agriculture
Cognitive Level:	Application, Synthesis
Materials Required:	Photocopies of the matrix blank included
Time Required:	One 40 minute period

BACKGROUND - For the Teacher

This lesson will be most useful to you and your students if you use it near the end of the Brazil unit. It will help your students to review and organize their knowledge of Brazil, and evaluate its meaning as a case study.

The first topics in the matrix call for information contained in Activity 2 and Activity 3 of this manual. This will allow students to begin their charts from a common knowledge base. Other topics call for information beyond this book. Some might have been dealt with in class, some will require outside research.

PROCEDURE

Part 1

Preparation:

1. Make a copy of the matrix blank for each of your students.

Part 2

Introduction:

2. Tell the class that they have learned enough about Brazil to begin drawing conclusions about what their information means.

Part 3

The Activity:

3. Distribute the Matrix Blank and explain that it serves two purposes:

   a) they are to summarize what they have learned to this point.

   b) they are to speculate on what will happen to Brazil and to Brazilians in the future.

   NOTE: Stress that their speculations can not be wrong if they are based on what has happened or what is happening.

4. Ask students to fill in as many cells as they can from the past and present columns of the matrix chart. They may need to refer to their previous work.

5. Whenever students have the information on past and present situations of a topic, they should

complete the future cell for that row with a predication.

6. Where information pags exist, ask your students to find the material through library research.

Part 4

Conclusion:

7. Have students describe their predictions for the future of Brazil.

8. If there are major disagreements about the future of any topics, have students debate their sides of the issue.

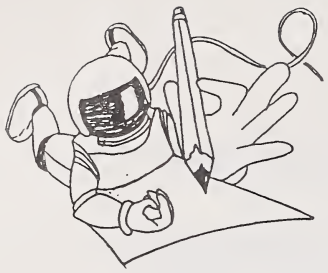
FOR DISCUSSION

1. What lessons do the history and likely future of Brazil hold for Canada?

2. Do issues in Canada today suggest we will become more like or unlike Brazil?

RELATED ACTIVITIES

1. Prepare a matrix chart for Canada like the one done here.



	1700 - 1950	1987	21st Century
Land ownership pattern			
Population distribution			
Population Size			
Five Major crops in order			
Five Major Importing Sources in Order			
Five Major Export Markets in Order			

Unit II: News Media and Agriculture

In Unit II your students will consider what information about agriculture is covered in newspapers. In two activities students are exposed to:

- the relative coverage given various parts of the food production system.
- the different emphases in rural, urban and national newspapers.
- the role of controversy in determining what is news.
- the differences between information, interpretation and opinion.

Activity 5

AGRICULTURE IN THE NEWS

Objectives: Students will identify and classify newspaper articles relating to production, processing, marketing, sales and service topics in Agribusiness. Students will then identify perspectives and evaluate newspaper articles as a source of information.

Curriculum Fit: Grade 9, Topic A
Canada: Industrial Development

Lesson Concepts: Present state of Canada's industrial development

Agriculture Concepts: Economic Importance of Agriculture
Production, processing and distribution system
Diversity of agriculture

Cognitive Level: Analysis, Evaluation

Materials Required:
- Issues for one week of a national newspaper (eg. Toronto Globe and Mail)
- Issues for one week of regional or city newspaper (eg. Calgary Herald)
- Several issues of a rural or local newspaper (eg. High River Times)
- Bulletin Board Space
- Scissors, tacks
- Stickers - two types, eg. red and green stars

Time Required: One 40 minute class period. You will need to collect newspapers for about two weeks before this day.

BACKGROUND - For the Teacher

Agribusiness includes interdependent primary, secondary, and tertiary industries. Examination of current events can provide a picture of current agribusiness issues.

Agriculture and related industries provide an excellent example of the interdependence of various levels of industry. Changes or events at one level can affect other levels as well as the consumer. Newspapers (and trade magazines) are often the best sources for current issues in any business. Agricultural topics are plentiful and represent a wide range of economic and social issues. Students should recognize the value of these information sources and know how to analyse and apply the content.

You will end up with a bulletin board display of news articles. For your convenience, we have included a sample of article headlines taken from the Calgary Herald and the Toronto Globe and Mail during one week in May, 1987.

You may find that locating, classifying and arranging articles on the display board fills an entire period. If so, the discussion can be left to the next day. It will lead easily into the start of Activity 6.

PROCEDURE

Part 1

Preparation:

1. Collect newspapers with the help of students over a two week period.
2. Allocate suitable bulletin board space.
3. Prepare banners for bulletin headings.
4. Use your banners to label and format your display.

Part 2

Introduction:

5. Introduce newspapers and periodicals as a source of information. Discuss perspectives of the writer (e.g. business or consumer) and the analysis of content (e.g. as fact or opinion).
6. Explain our classification system for articles and the headings on the bulletin board.

Part 3

The Activity:

7. Distribute newspapers to individuals or groups. Each student is to find an article dealing with agribusiness.

8. Each student will examine his/her own article for the following:

   a) What level of industry is involved?
   b) Does the article represent facts or opinions? Use stars or some other means to label each article for the display (e.g. red stars for factual articles, green for opinions).
   c) Summarize the content for later presentation to the class. What main issue or topic is presented?

9. Students should add the date, the name of the paper and their own name to the top of each article.

10. Post the articles on the bulletin board in the correct location according to level of industry and perspectives of the writer. Sub-grouping of articles dealing with similar topics will help in later discussion. Pictures will also add a visual dimension to the display.

11. Allow 10 minutes for cleanup tying up loose ends and changes to the board.

Part 4

Conclusion:

12. Examine your display with reference to the discussion questions provided. (Use the next period if time is not sufficient).

FOR DISCUSSION

Many questions will originate from students as they attempt to classify and understand articles. Encourage interaction among students with articles on similar topics.

After completing the display discuss the following:

1. Do our newspaper articles represent mainly facts of opinions? (Count the stickers as a survey tool!)

2. Should we base our own opinions on facts or other opinions?

3. How can we arrive at a more informed opinion?

4. How might these issues change according to season? Identify seasonal, or long term issues.

5. Identify some local, regional, national, or international issues.

RELATED ACTIVITIES

1. Discuss the differences between trade magazines and newspapers. How does content differ? Where would you expect to find more detailed and comprehensive information?

2. Have students research and write articles about an event or issues affecting different levels of an industry in their own community. Publish their articles in a student newsletter.

3. Research other sources for background information into the issues discovered during this research project.

4. Continue with lesson "Current Issues in Agriculture."

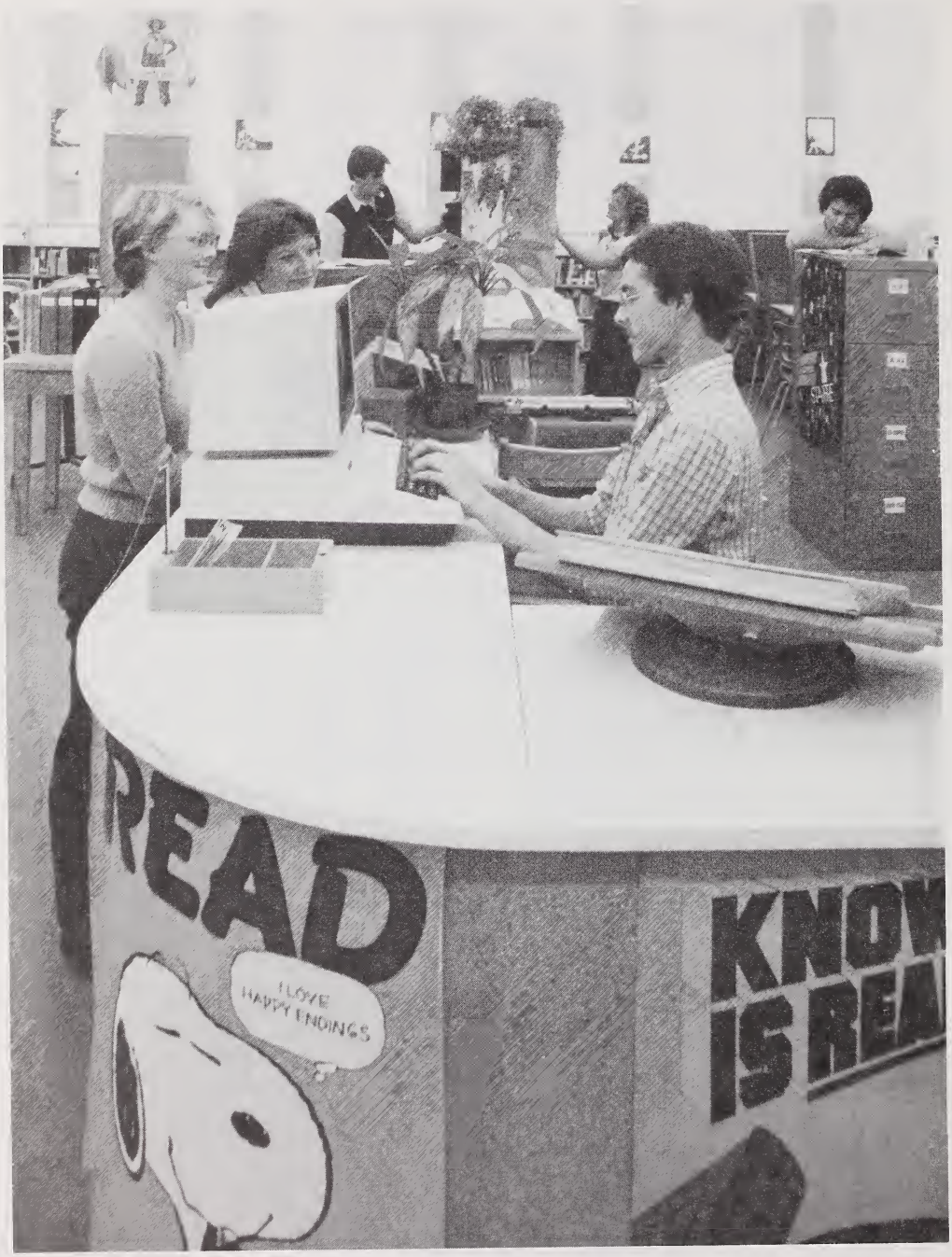
References and outside resources:

Bowden, Garrod & Massiah, Canadian Industrialization, pp 106-131

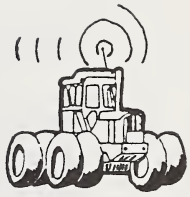
Agribusiness in the News!

	Production	Processing/Marketing	Sales /Service
Business Issues	**Science enhancer project draws grain growers' ire** Farmers fear loss of new markets for surplus grain	**CME cattle futures reach new contract highs**	**Veteran ice cream maker scoops out an important market niche** Secret is no artificial flavors or colors
		Speculators driving up grain, oilseed prices	
	Western farmers need long - term aid, Mulroney told	**Wheat prices Futures soar after Soviet purchase bid** Wheat futures prices climb as Soviets agree to purchase of American grain	**Farm implements firm gets 12.5 million in aid** Money to be used to reorganize and expand the company
	Mulroney expresses concern for Western farmers stops short of proposing further aid	**U.S. Aims at Subsidies** Dropping of grain subsidies by the end of the century will occur if other countries do the same says Administration	**OECD to fight farm trade wars** A truce was called in the trade wars that have caused low grain prices which have hurt farmers in many parts of the world
	Tell farmer's your plans, Tories advised Farmers need to know if there will be a deficiency payment at the end of the coming crop year before they plant. Incomes are now down to one quarter of what farmers enjoyed a few years ago	**Subsidized U.S. Grain has contrary effects** How are prices pushed both higher and lower on futures markets at the same time by U. S. grain sales? Loss of surplus and low levels of production could mean shortages in the long term	**Global forums hold solutions** Banks express concern over plight of farms but say talks hold promise of solutions.
	Province seeking ways of keeping Sprung greenhouses in Alberta	**Grain subsidies now have an important role in the U.S.** - Subsidies give us an opportunity for farm reform policy"	
	Calgary greenhouse moved to St. John's Hydroponics research project forced to relocate	**Floor price for sugar no help** A floor price would reduce the ability of sugar beets to compete for world sugar markets against cheaper alternate sources	
		Energy, Farm Loans hit Bankers' Wallets Most bank losses due to bad loans in farm and energy sectors	**Farmers gambled cash on hopes** Approval to market wild game meat now required for gamble to pay off
	Prairie deserves more than trampling		
	Preserving wildlife boosts rancher's yields Hawks, eagles and coyotes help to control mice and squirrels	**Farmers hoping for rain** Manitoba farmers having a dry summer	**Scientists work to cut cholesterol in foods** Looking at extraction processes for butter and eggs
	Crop seeding runs ahead of Schedule Fine weather and early spring has been excellent for farmers		**Benefits of fish oil applied to raw meat** Diet of fish oils may increase nutrition and reduce fats in beef cattle
Consumer Issues	**Consumer conscience a lever for animal rights** Shoppers who care about animal rights can insist on humanely raised meat	**Food fight warming up over irradiation study** Health concerns continue controversy over use of radiation to kill microbes and prevent spoilage of foods	**Suggestion for labling of irradiated food called an attempt to fool consumers**
			Results of studies on irradiation bolster arguments on both sides
	Barnyard the next animal rights battlefront Professor to teach animal ethics Protests feared against factory farming methods		**Consumers want quality and variety**
	Livestock "doctoring" causes worry Widespread use of antibiotics in healthy cattle causes concern	**CIDA backs irradiation in Third World** Although not yet approved in Canada radiation is seen as an important means of reducing food spoilage by Brazil	**Restaurant industry is not eager for game on menus** Predicts that the market will develop slowly if at all
			Reasons given to shun meat vary
			Vegitarians meet to brainstorm Discuss merits of eating vegitable diet

The summaries above are from the Calgary Herald and the Toronto Globe and Mail (May 7 - May 14, 1987)


READ
I LOVE HAPPY ENDINGS
KNOW
IS REA

Activity 6



CURRENT ISSUES IN AGRICULTURE

Objectives: Students will recognize issues in agribusiness and will apply economic concepts to understanding of these issues. They will then research an issue of their choice and evaluate its effects on other levels of agribusiness and on themselves as consumers.

Curriculum Fit: Grade 9, Topic A
Canada: Industrial Development

Lesson Concepts: Present state of Canada's industrial development

Evaluate data by isolating bias and/or emotionalism in at least two different viewpoints

Agriculture Concepts: Economic importance of agriculture
Capital and technology intensity
Production, processing and marketing system
Importance of soil and water
Diversity of agriculture

Cognitive Level: Application, Analysis, Synthesis

Materials Required: Bulletin Board and articles developed in Activity 5

Class set of worksheets (a master is provided)

Time Required: Two 40 minute class periods

BACKGROUND - For the Teacher

The major trends in agriculture have been identified elsewhere (Bowden, Canod, Massiah, Canadian Industrialization, 1983 pp. 106, 131) as increased mechanization, increased specialization, larger farm size, increased government intervention and increased concentration of ownership.

Other issues such as those involving government subsidies, market fluctuations, new products, new farming methods, and consumer concerns also affect the industry and illustrate the complexities of the marketplace. A close examination of newspaper resources will sensitize students to current issues in Agriculture. This will also increase awareness of the interrelationship between government, industry and the individual.

PROCEDURE

Part 1

Introduction:

1. This activity uses the display board you and your class developed in Activity 5. Begin by reviewing the work done and results achieved yesterday.

2. You may wish to preselect a relevant topic to introduce this lesson. Have your students examine all topics to determine central issues.

Part 2

The Activity:

3. List the main issues for each article on the board as a positive statement. E.g. "farmers demand financial support for grain crops from government." Students may use their own summaries to report on specific articles. Group articles that focus on the same issue.

NOTE: In the articles we collected as a sample we identified six themes:

1 Government involvement in business is increasing.
2 Controversial methods are being considered to increase production and improve processing.
3 Consumers want healthy, nutritious, foods and look for quality and variety.
4 Animal rights groups are concerned about factory farming methods.
5 Diversification may improve the survival potential of a business or the health of an economy.
6 Farmers are concerned with conservation issues.

4. Decide if the article is primarily fact or opinion on each issue. Is additional information required for a given topic?

5. Where could we find additional information on these topics?

Part 3

Conclusion:

6. Ask each student to select a single topic or issue, and compare benefits and/or possible harm to producers, processors, service and consumer levels of agribusiness using the worksheets provided.

FOR DISCUSSION

1. (re our Theme 1)

   Should producers facing hard times be supported with subsidies or guaranteed prices for crops? What are the benefits of subsidies to a primary industry? What are the harmful effects to the marketplace?

2. (re our Theme 2)

   Irradiation can be used to prevent spoilage of consumable foods for harmful affects? Should this method be allowed without adequate testing? What is adequate testing?

3. (re our Themes 2 and 3)

   Antibiotics are used to protect the health of livestock. Should we be concerned with these substances in our food? What can be done?

4. (re our Theme 3)

   What tactics are employed to increase consumption of different foods? Who benefits from these approaches? Who does not?

5. (re our Theme 4)

   What are factory farming methods and why do we use them? What are the alternatives?

6. (re our Theme 5)

   What is diversification?
   Why is diversification good for a business?
   What are some of the problems?

7. (re our Theme 6)

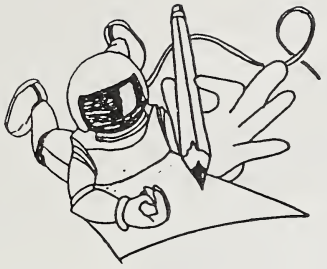
   What are some of the effects of farming on our environment?

RELATED ACTIVITIES

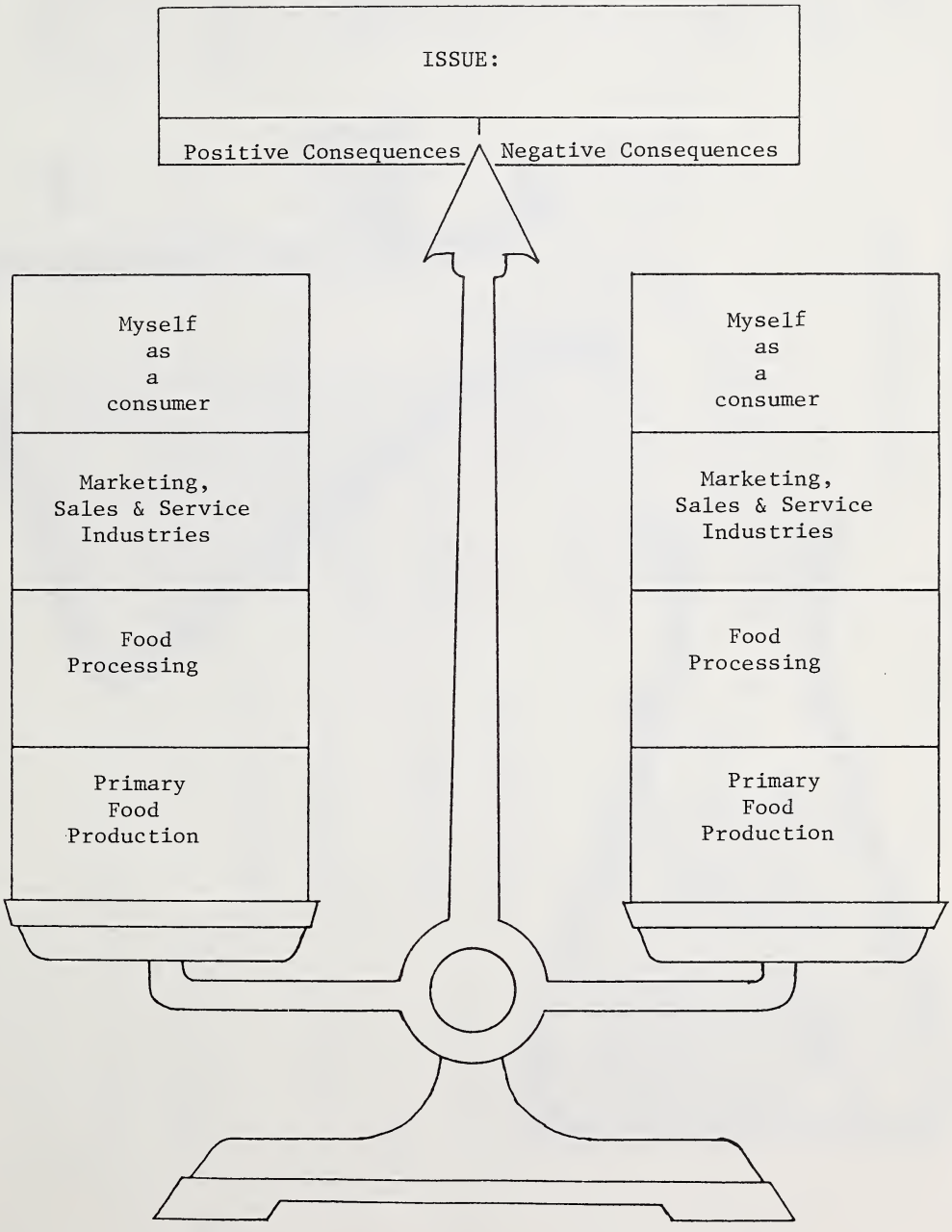
1. Research and debate an issue chosen by the class.

2. Obtain additional information from agricultural publications and report to class.

Name: _____



1. Select an issue from those discussed in class.
2. Describe any social, political, or economic effects on the levels shown.



Agribusiness in the News!

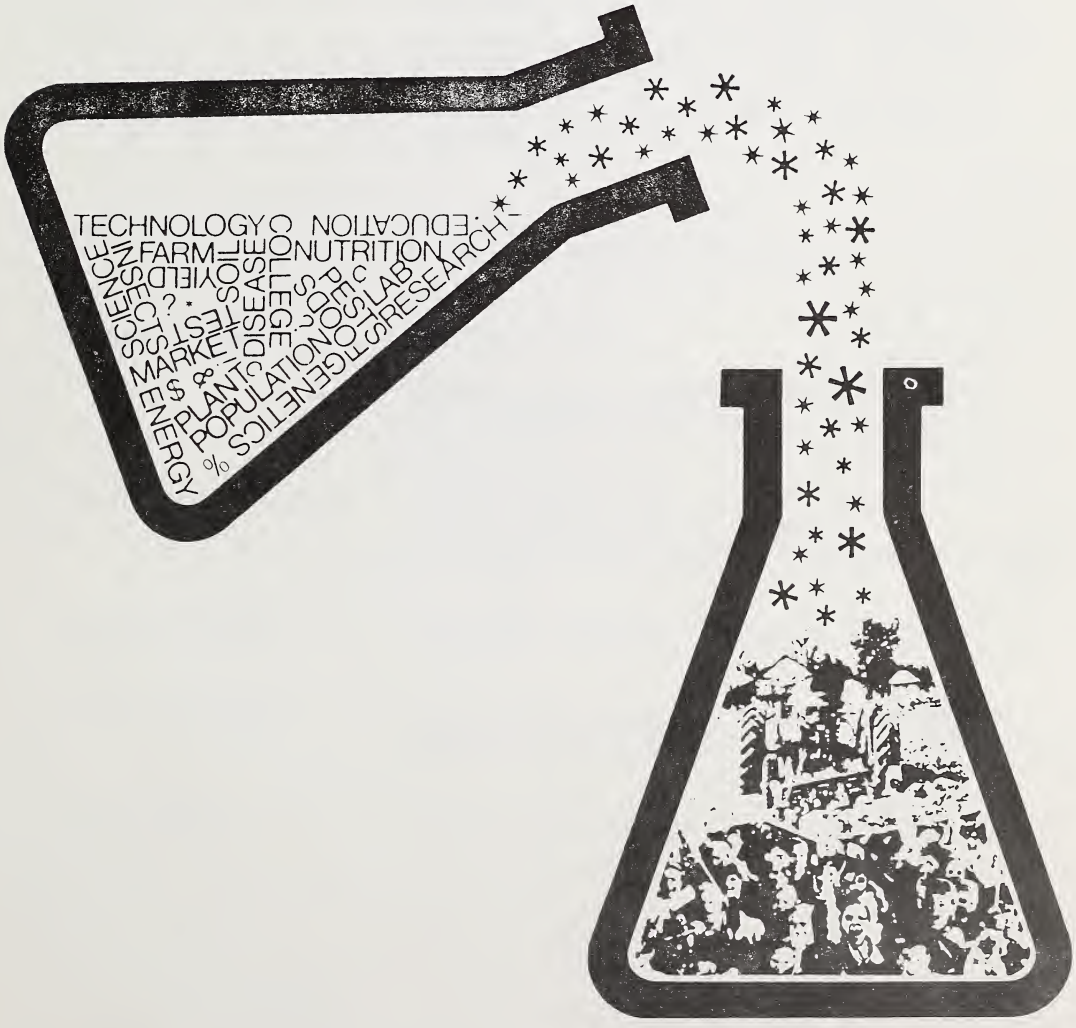
	Production	Processing/Marketing	Sales /Service
Business Issues	(5) Saskatoon cooperative project draws grain growers' ire Farmers fear loss of new markets for surplus grain (1) Western farmers need long - term aid, Mulroney told (1) Mulroney expresses concern for Western farmers Stops short of promising further aid. (1) Tell farmer's your plans, Tories advised Farmers need to know if there will be a deficiency payment at the end of the coming crop year before they plant. Incomes are now down to one quarter of what farmers enjoyed a few years ago (1) Province seeking ways of keeping Sprung greenhouses in Alberta (5) Calgary greenhouse moved to St. John's Hydroponics research project forced to relocate (1) Floor price for sugar no help A floor price would reduce the ability of sugar beets to compete for world sugar markets against cheaper alternate sources (1) Energy, Farm Loans Hit Bankers' Wallets Most bank losses due to bad loans in farm and energy sectors (6) Prairie deserves more than trampling (6) Preserving wildlife boosts rancher's fields Hawks, eagles and cycles help to control mice and squirrels (1) Farmers hoping for rain Manitoba farmers having a dry summer (1) Crop seeding runs ahead of Schedule Fine weather and early spring has been excellent for farmers	(5) CME cattle futures reach new contract highs Speculators driving up grain, oilseed prices (5) Wheat prices Futures soar after Soviet purchase bid Wheat futures prices climb as Soviets agree to purchase of American grain (1) U.S. Aims at Subsidies Dropping of grain subsidies by the end of the century will occur if other countries do the same says Administration (1) OECD to fight farm trade wars A truce was called in the trade wars that have caused low grain prices which have hurt farmers in many parts of the world (1) Subsidized U.S. Grain has contrary effects How are prices pushed both higher and lower on futures markets at the same time by U.S. grain sales? Loss of surplus and low levels of production could mean shortages in the long term (1) Global forums hold solutions Banks express concern over plight of farms but say talks hold promise of solutions. (1) Grain subsidies now have an important role in the U.S "Subsidies give us an opportunity for farm reform policy" (5) Farmers gambled cash on hopes Approval to market wild game meat now required for gamble to pay off (3) Scientists work to cut cholesterol in foods Looking at extraction processes for butter and eggs (3) Benefits of fish oil applied to raw meat Diet of fish oils may increase nutrition and reduce fats in beef cattle	(3) Veteran ice cream maker scoops out an important market niche Secret is no artificial flavors or colors (1) Farm implements firm gets 12.5 million in aid Money to be used to reorganize and expand the company (3) Restaurant industry is not eager for game on menus Projects that the market will develop slowly if at all
Consumer Issues	(4) Consumer conscience a lever for animal rights Shoppers who care about animal rights can insist on humanely raised meat (4) Barnyard the next animal rights battlefront Professor to teach animal ethics Protests feared against factory farming methods (4) Livestock "doctoring" causes worry Widespread use of antibiotics in healthy cattle causes concern	(2) Food fight warming up over irradiation study Health concerns continue controversy over use of radiation to kill microbes and prevent spoilage of foods (2) Suggestion for labling of irradiated food called an attempt to fool consumers (2) Results of studies on irradiation bolster arguments on both sides (2) CIDA backs irradiation in Third World Although not yet approved in Canada radiation is seen as an important means of reducing food spoilage by Brazil	(4) Consumers want quality and variety (3) Reasons given to shun meat vary Vegitarians meet to brainstorm Discuss merits of eating vegetable diet

The summaries above are from the Calgary Herald and the Toronto Globe and Mail (May 7 - May 14, 1987)

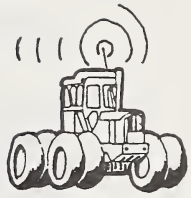
Unit III: Social Goals Reflected in Agriculture

Unit III deals with aspects of the conflicts between short-term and long-term problems, between progressive and cyclic definitions of time, and between monetary and non-monetary values.

Lessons 7 and 8 establish the basis for the conflicts being considered. Lesson 7 is based on discussion; Lesson 8 includes other activities. Lesson 9 is a board game in which students choose farming strategies and determine their long term consequences to a farmer and his land.



Activity 7



SO JUST WHAT DO WE WANT?

Objectives: Students recognize that quality of life is determined by a number of factors. They will identify examples of how renewable and non-renewable resources have contributed to our present standard of living. They will be asked to identify the materialistic goals of agriculture and how conservation and responsibility for the environment apply to this industry.

Curriculum Fit: Grade 9, Topic A
Canada: Industrial Development

Lesson Concepts: Quality of life

Materialism and conservation as practised in the agriculture industry

Agriculture Concepts: Economic importance
Capital and technology intensity
Production, processing and distribution system

Cognitive Level: Knowledge, Analysis, Synthesis, Evaluation

Materials Needed: Pictures from magazines illustrating factors determining quality of life or use of resources

Time Required: Two 40 minute periods

BACKGROUND - For the Teacher

In present day Alberta, as in much of the world, conflict and disagreement are major aspects in most public activity. In agriculture specifically these discord-raising issues include confinement animal raising, aerial pesticide spraying, expanded irrigation or foothills grazing, game ranching, insecticides use and many others.

In each of these areas people will argue strongly for each side of the case. Many of these arguments are rooted in a fundamental disagreement about two values: materialism and conservationism.

Materialism can be defined as the view that quality of life is determined by our level of productivity and ownership of material possessions, beyond the satisfaction of our basic needs for food and shelter. People with this view often argue that problems accompanying our materialistic lifestyle can be overcome by new technologies.

In contrast, conservationism is the view that the production of material possessions is less important that the maintenance of existing environmental conditions. Conservationists are concerned with the potential for permanent damage to our environment while creating disposable material goods. They suggest that our quality of life is actually declining through a dependence on non-renewable resources, destruction of the environment, damage or loss of renewable resources, and health problems caused by the release of harmful chemicals into the environment.

A resource is anything that we can use. There are two generally recognized types of resources. Renewable resources can be used over and over again if properly cared for. Non-renewable resources are limited in quantity. New sources must be continually found although some commodities may be recycled.

Agriculture is an important industrial component of our society with 4% of the population producing 13% of our Gross National Produce in primary food production, and 40% of our Gross National Product in related industries. It is a primary industry based on a renewable resource (agriculture lands), but it is also a consumer of non-renewable resources. (Chemical fertilizers, fuels, machinery, building materials.)

Agriculture contributes to the materialistic goals of society by:

- Producing quality goods at a reasonable price to the consumer.
- Creating income for the producer.
- Purchasing goods and services from others.

At the same time it addresses the conservation goals of society when it:

- Maintains soil in good condition.
- Produces healthy and nutritious foods.
- Uses water and energy resources efficiently.
- Protects the environment and avoids contamination by chemicals.
- Provides a habitat for wildlife.

PROCEDURE

Part 1

Preparation:

1. Prepare charts similar to Figures 1 or 2 showing some of the elements which determine our quality of life.

2. Collect back issues of varied magazines as a source of pictures. Have your students contribute more.

Part 2

Introduction: (Day 1)

3. Ask students what factors contribute to their quality of life. Record answers in a format similar to figure 1.

4. When you have as many contributions as possible, use Figure 1 as an example of another summary of factors. Have the students compare the charts, evaluate items that are in one chart only, and develop a composite chart that they feel is complete.

Part 3

The Activity: (Day 1)

5. Assign each student one aspect of the quality of life chart and have them choose a magazine. (Students may share if there are not enough magazines.)

6. Have the students look through the magazines for pictures that illustrate their assigned part of the quality of life chart. They should cut out any that they find and use them to build a class collage on quality of life.

   Allowing for clean up time, this work will probably take until the end of a class period.

(Day 2)

7. Using the collage chart from yesterday, ask the students how each aspect of the quality of their own lives is influenced by agriculture.

8. Ask the students to imagine that they run a farm. How would each aspect of their quality of life be influenced by being a farmer?

9. Define materialism and conservation as they are used in Social Studies.

a) Ask students to identify the areas of their chart that would be most important to a materialist society and to a conservationist in that society.

b) Ask students what goals of agriculture are materialistic.

c) Ask students how conservation values and responsibility for the environment apply to agricultural values.

Part 4

Conclusion: 10. Agriculture is a primary industry that, like the rest of our society, must constantly balance the importance of materialist and conversationist values in practical issues.

FOR DISCUSSION

1. Are we a materialistic or conservationist society?
2. Is the division really all that clear?
3. How does profit motive affect our choices?
4. What are some examples of renewable resources?
5. What are some examples of non-renewable resources?
6. How are industrial societies dependent on non-renewable resources?
7. Why should resources be conserved and protected?
8. What would be the consequences of non-renewable resources were to be exhausted?

RELATED ACTIVITIES

1. Make a display of magazine and pictures to illustrate the contribution of resources to our standard of living based on the format in Figure 2.

2. Borrow the film The Reason Why from Alberta Agriculture's film library. Have students use it to answer the question "How does agriculture affect my life?"

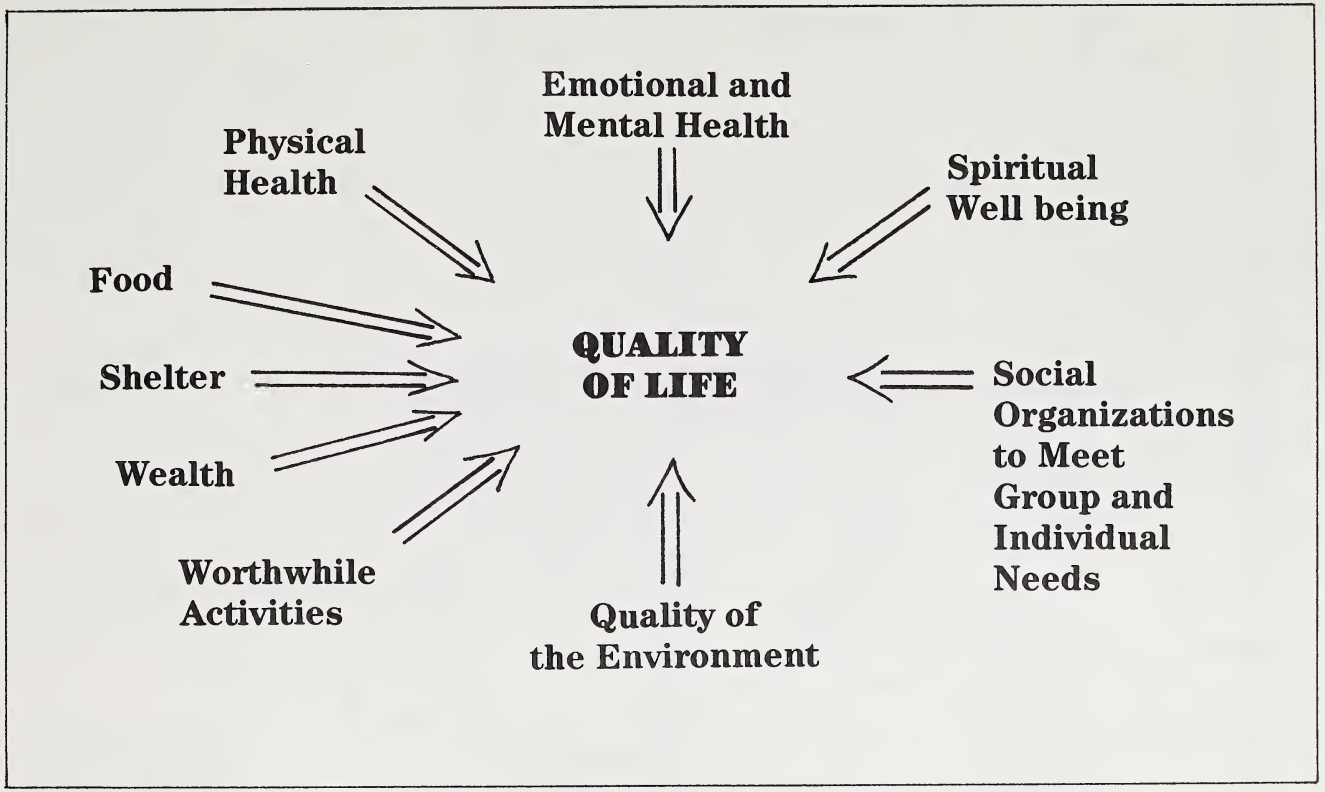


FIGURE 1: FACTORS AFFECTING QUALITY OF LIFE

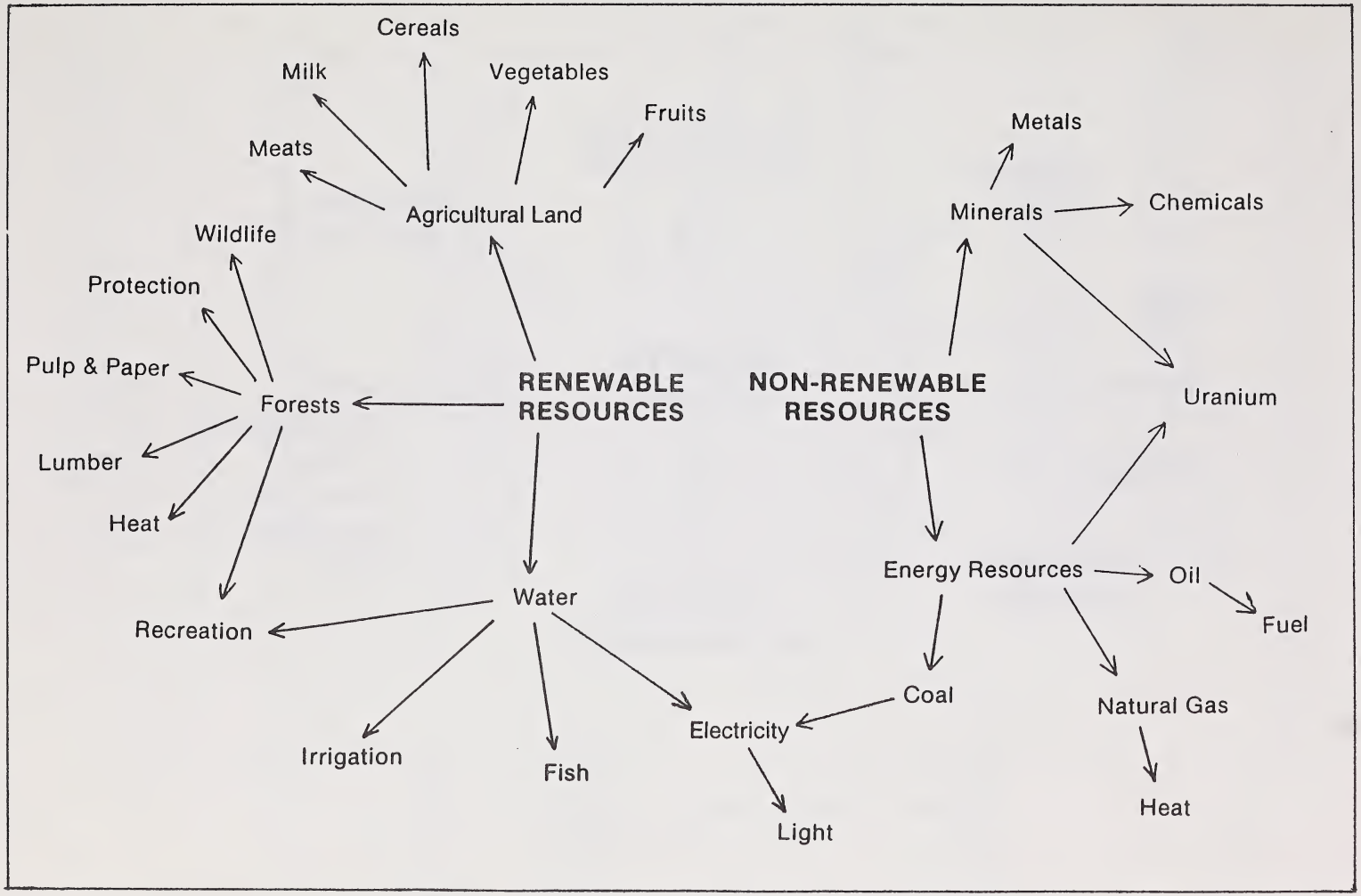


FIGURE 2: RENEWABLE AND NON-RENEWABLE RESOURCES

Activity 8

WHAT CHOICES DOES AGRICULTURE HAVE?

Objective:	This lesson presents the vocabulary for discussing the farming methods used in agriculture. It will familiarize students with some of the environmental implications of the various agricultural practices.
Curriculum Fit:	Grade 9, Topic A Canada: Industrial Development
Lesson Concepts:	Materialistic and conservation practices in agriculture
Agriculture Concepts:	Capital and technology intensity Importance of soil and water
Cognitive Level:	Knowledge, Comprehension, Analysis
Materials Required:	Photocopies of: - background information - crossword puzzle
Time Required:	One 40 minute class period

BACKGROUND - For the Teacher

Economics in North America and Europe have tended for many years to encourage people to produce single goods for sale, and to use the resulting money for purchasing the necessities of life. Recently this tendency has accelerated.

Many people do not recognize that agriculture has been under the pressures of this trend with all other sectors of the economy. Thus, although it is a diverse and dynamic sector of the economy, most people think of agriculture as farming. Furthermore, although farming is a cash intensive and technology intensive business, many people think of it as raising food for the home and selling the surplus. This lag in perception produces numerous conflicts both within individual farmers and between farmers and other groups.

One result of these conflicts is that farmers are encouraged to pursue several different paths to success.

This lesson will introduce your students to these different ways of farming. It serves as a basis for Activity 9, The Conservation Farming Game.

A developing dust storm.

PROCEDURE

Part 1

Introduction:

1. Explain that this class period will introduce some terms that will be important in playing the board game in Lesson 9.

Part 2

The Activity:

2. Distribute the information summaries to the class one at a time.
3. Ask selected students to read the definitions on each sheet aloud for the class.
4. Use the discussion questions provided to emphasize the important points.
5. Have your students complete the crossword puzzle as a test of comprehension.

Part 3

Conclusion:

6. Tell your students that the words they used for the crossword puzzle are essential to playing the Farming Game.

FOR DISCUSSION

1. Which farming method would require the greatest input of energy and non-renewable resources? What is gained by this type of farming?
2. Which tillage practices would you consider as conservation practices?
3. Trace the paths of agricultural chemicals like fertilizers and pesticides in the water cycle.
4. Where are residues of these chemicals likely to accumulate?
5. How do these accumulations harm our environment?
6. What do you think is meant by the term "integrated pest controls"? How might they be used by a farmer?

RELATED ACTIVITIES

1. Activity 9 - "The Farming Game"

   Use this lesson as background information for the game.

2. Watch the film "Pest Wars" available from Alberta Agriculture for a farmers view of pest controls. A variety of alternative methods are presented.

3. Watch the film "A Matter of Soil" available from Alberta Agriculture. The importance of organic matter to soil conservation is discussed.

OUTSIDE RESOURCES

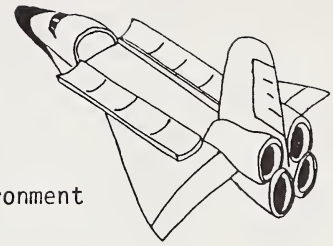
16 mm Film "Pest Wars", 1985, available from Alberta Agriculture.

16 mm Film "A Matter of Soil", 1984, available from Alberta Agriculture.

REFERENCES

Conservation Farming. Published by Deere and Company, 1980.

Journal of Alternative Agriculture. Volume 1. Number 1. 1986.



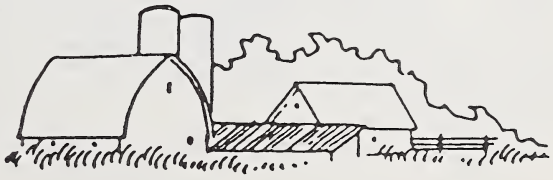
DATA SHEET 1

Demands of Various Farming Approaches on the Environment

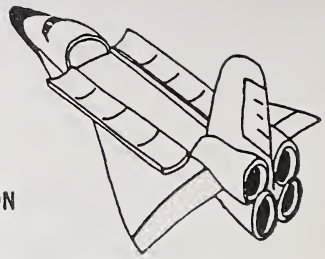
Monoculture agriculture is the growing of a single product such as wheat on a large scale. This is a very efficient method and produces a large quantity of grain at a low cost per tonne. It allows a farmer to use complex and expensive machinery in place of laborers and depends on the use of chemical fertilizers and chemical pesticides.

Diversified agriculture (mixed farming) is the production of several crops on a farm at the same time. This ensures that the farmer does not depend on a single source of income. A farmer must know many types of agriculture, and many require several kinds of equipment.

Organic farming avoids chemical fertilizer and pesticide input and seeks to use soil conservation practices, energy efficient production systems, and natural growth processes. These procedures require many people to accomplish their work.



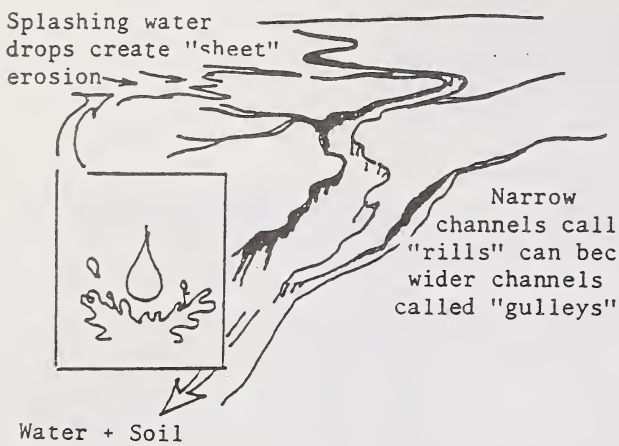
Which farming method would require the greatest input of energy and non-renewable resources?

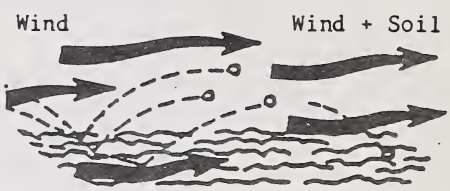


DATA SHEET 2

HOW TILLAGE PROCEDURES AFFECT SOIL EROSION

Cultivation and tillage prepare a field for seeding. It may lead to soil loss through erosion by wind or water.


Splashing water drops create "sheet" erosion
Narrow channels called "rills" can become wider channels called "gulleys"
Water + Soil



"Saltation" is the bouncing movement of soil particles by the wind.

" Soil Creep " is the mass movement of many particles

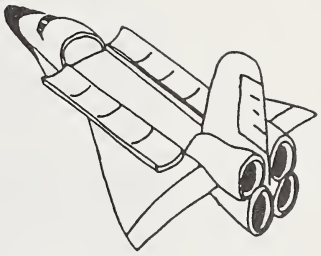
When soil is laid bare over a period of time, wind and water have an opportunity to act on the soil - moving it from cropland to such inaccessible areas as ditches and tree lines.

Which Tillage Practice Below Would You Consider For Soil Conservation?

Conventional Tillage
es frequent plowing or mixing the soil to conserve moisture d control weed growth. It often cludes summer fallowing where a eld is kept bare for an entire ar, and fall plowing where a eld is kept bare over a winter.

Zero tillage
does not disturb the soil between crops. It depends on heavy and powerful seed drills to force seed into soil with old stubble attached. Weeds are controlled with herbicides.

Minimum Tillage
disturbs only the top few inches of soil, and does so as rarely as possible while still controlling weeds.



DATA SHEET 3: Maintaining Soil Nutrients

Plants use nutrients from a fertile soil, and when we harvest crops these minerals go with them.

HOW CAN FARMERS RESTORE THE NUTRIENTS THEIR CROPS TAKE AWAY?

CHEMICAL FERTILIZERS

These are factory-produced granules that dissolve in water to release essential minerals ready for plants to use.

+ can match nutrients exactly to soil needs.
+ simple to spply, easy to handle.
- do not contribute to soil structure or organic matter.
- excess minerals can leach away and contaminate ground water.

GREEN MANURING

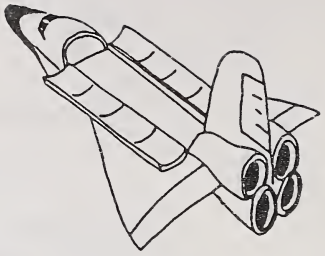
This process depends on a crop rotation that includes some years growing legumes and plowing them into the soil.

+ adds usable nitrogen to the soil.
+ builds soil organic matter.
- each field is taken out of economic production or food production for one year in every cycle.

COMPOST

This material is formed by the partial decomposition of plant and animal waste materials.

+ nutrients are released slowly by bacterial action.
+ increase soil organic matter and improved soil structure.
- requires farmer to raise animals.
- quality varies and is difficult to determine.
- long preparation time.
- application problems.



DATA SHEET 4 PEST CONTROL STRATEGIES

PHYSICAL PEST CONTROLS - changing the environment to disrupt the life cycle of the pest.

SUMMERFALLOW - the continuous tilling of a bare field; kills weeds before they produce seeds.

CROP ROTATION - planting different crops each year; removes food supply of specialized insects.

These methods require a lot of labor and equipment, which increases the farmer's expenses.

Weeds compete with crops for space, nutrients and water. Weed seeds reduce the value of crop seeds.

WHY CONTROL PESTS?

Insects spread plant diseases, eat plants while growing, and eat or contaminate crops in storage.

BIOLOGICAL PEST CONTROLS
- using an organism to compete with prey on, or parasitize some pest.

- Hawks and owls prey on rodents.
- Ladybugs prey on aphids.
- Some wasps lay eggs in caterpillers.
- Some bacteria infect grasshoppers but nothing else.

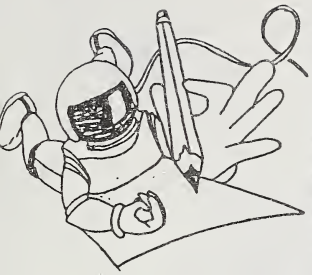
These can be difficult to obtain, and they do not completely eliminate all the target pests.

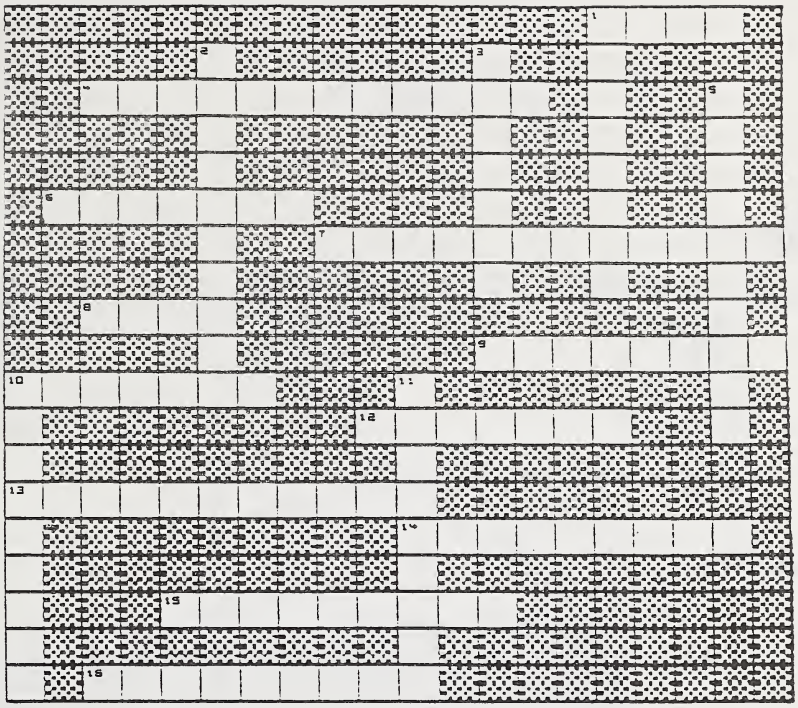
CHEMICAL PEST CONTROLS (PESTICIDES)

HERBICIDES to control weeds

INSECTICIDES to control insect pests

These are designed to poison only target pests, but many people fear their possible effects on people.



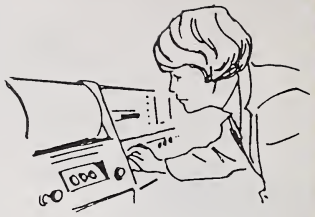


ACROSS CLUES

1. a general name for a harmful organism
4. a chemical means of reducing crop losses to insects
6. one way by which we can lose our agricultural lands
7. exposes bare soil to erosion by wind and water
8. competes against farm crops for growing space and nutrients.
9. something in our environment that we can use
10. a fertilizer made from plant and animal waste products
12. prepares and maintains the soil for the growing of plants
13. a type of farming practice which emphasizes production of a single crop on a large scale
14. a type of resource which can be used over and over again
15. one way that we can lose our water resources
16. a soil characteristic which is necessary for agricultural productivity.

DOWN CLUES

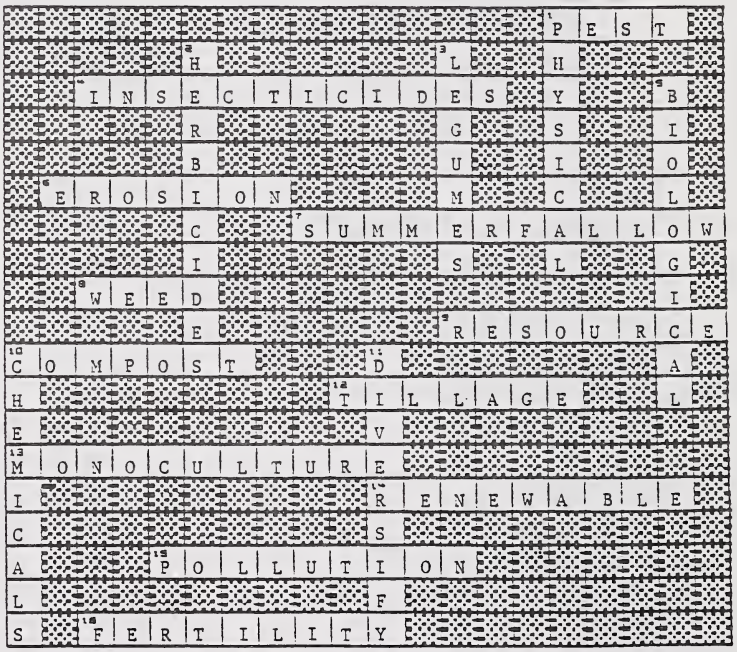
1. a means of pest control that involves changing the environment in which a particular pest lives
2. a chemical means of controlling plantlike pests
3. a type of plant which replaces nitrogen to the soil. The French word for vegetable.
5. a type of pest control which sometimes pits one organism against another
10. used extensively in modern agriculture to increase productivity
11. one way a farmer can reduce his dependence on a single source in income



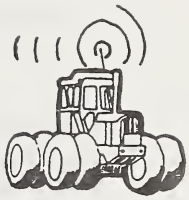
WORD LIST:

BIOLOGICAL
CHEMICALS
COMPOST
DIVERSIFY
EROSION
FERTILITY
HERBICIDES
INSECTICIDES
LEGUMES
MONOCULTURE
PEAT
PHYSICAL
POLLUTION
RESOURCE
RENEWABLE
SUMMERFALLOW
TILLAGE
WEED

ANSWERS:



Activity 9



THE FARMING GAME

Objective:	This lesson demonstrates how productivity is related to consumption of natural resources and protection of the environment. Through choices involved in playing the game, your students assume the responsibility of a farmer and determine the optimum farming methods to satisfy productivity and conservation objectives.
Curriculum Fit:	Grade 9, Topic A Canada: Industrial Development
Lesson Concepts:	Materialistic vs. conservation objectives in agriculture Choices in modern agriculture involve compromises between production and conservation objectives
Agriculture Concepts:	Technology and capital intensity Importance of soil and water
Cognitive Level:	Application, Analysis, Synthesis
Materials Required:	Photocopies of: - How to Play (page 1) - The Game Board
Time Required:	one 40 minute class period

BACKGROUND - For the Teacher

The vocabulary and background information that your students need to play this game is provided in Activity 8. The game itself asks students to make a variety of choices regarding resource use and farming procedure. They will be able to evaluate their decisions by counting up their yields each trip through the game board.

PROCEDURE

Part 1

Introduction:

1. As an introduction, discuss the ideas of responsibility, choice, and compromise in industry and agriculture with your students.

Part 2

Playing the Game:

2. Tell the students that they have inherited a farm from a long lost relative, and are required to go farming. The material wealth that they will enjoy (big home, cars, vacations, etc.) will be determined by their incomes which, in this case, will be measured by the productivity of their farm.

3. Explain the game and how to rate the operation of the farm. You may wish to use an overhead transparency to demonstrate how to number paths for each year, how to "cross off" resources, and how to determine production.

4. Divide the class into 3 groups. Assign each group one of the three types of farms at the top of the game.

5. Go through the first year as a class, then let the class work through the next 9 years on their own.

Part 3

Conclusion:

6. Discuss individual results and draw general conclusions based on overall performance of the class.

FOR DISCUSSION

1. Objectives and Problems.

   How many farmers in each group changed their type of farm during the game? How many kept the same type of farming operation? What are some of the reasons that individuals changed their type of farm?

2. Productivity and Remaining Resources.

   Did the students with productivity above the class average use more or fewer non-renewable resources than the class average? Did they have more or less of renewable resources at the end? What does this say about agriculture which is dependent on high productivity?

3. Resources Costs and Effects on Productivity.

   How could we tell if the money spent on equipment, fertilizer, and pesticides is worthwhile in terms of increasing our income?

4. Making Production Decisions.

   What are some of the things that a farmer must consider when making these types of production decisions? Is he really concerned about the loss of resources at this time? What are his major considerations?

5. What will happen to the cost of Non-Renewable resources as they become less abundant? What effect will this have on consumption?

RELATED ACTIVITIES

Examine the following graphs which show current trends in Farming in Canada today.

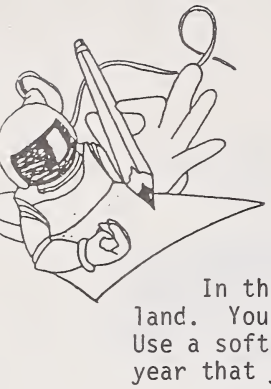
Identify the major trends presented and discuss the causes and potential problems.

Can we make any predictions for the future based on this information?

How do actual trends differ from those in our game? Account for this difference?

References:

The Daily. Published by Statistics Canada. June 3, 1987



THE FARMING GAME

How to Play

In this game, you inherit a farm with 500 hectares of cultivated land. You operate your farm by choosing a path down the game board. Use a soft pencil to indicate your path, then number the path for each year that you farm as 1, 2, 3, etc.

Try a path for 3 years. If you then see a problem which might affect your future operation, make changes in your path to correct the problem. You may even change the type of farming operation, before seeding and at the beginning of a year, if you purchase the necessary equipment.

Along the sides of the game boards are supplies of resources. They are represented by grids of squares. Each square is a unit of a resource. As you make important decisions about the operation of your farm you will also need to deduct the cost to the environment and to your natural resources. Do this by using numbers for the current operating year to "cross off" units of the available resources. You may REPLACE some resources by erasing these numbers when the opportunity arises.

At the end of each year you will determine your crop yield. The crop yield is represented by a truck symbol along the path. Each truck symbol that you pass means 5 truck loads of grain (or equivalent production). The number of trucks is your yield for the year, minus any losses that you may have encountered along the way.

Find your total production for 10 crop years by completing the circuit 10 times from seeding to harvest. Summarize your production below.

How to rate your Farming Operation

Crop Yields (in truck symbols passed.)

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

6. _____ 7. _____ 8. _____ 9. _____ 10. _____

Each symbol represents 5 truck loads. If each truck load is 10 tonnes, my 10 Year Total Crop Yield is _____ tonnes.

The Percentage of my Non-Renewable Natural Resources remaining after 10 years is:

Energy Resources $\frac{\text{\_\_\_\_\_ units}}{36 \text{ units}} \times 100 =$ _____ %

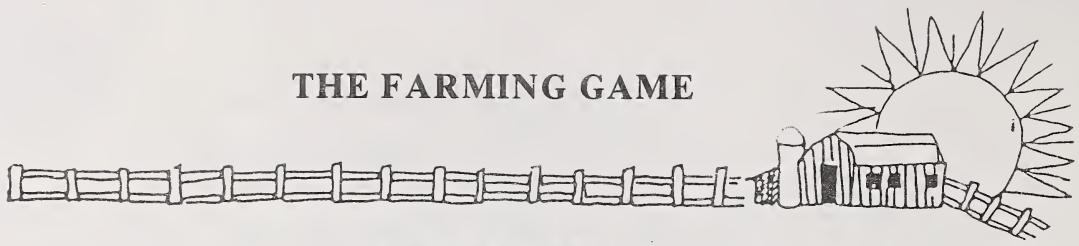
Agricultural Chemicals $\frac{\text{\_\_\_\_\_ units}}{36 + 24 \text{ units}} \times 100 =$ _____ %

The Percentage of my Renewable Natural Resources remaining after 10 years is:

Agricultural Lands $\frac{\text{\_\_\_\_\_ units}}{24 \text{ units}} \times 100 =$ _____ %

Water Resources $\frac{\text{\_\_\_\_\_ units}}{24 \text{ units}} \times 100 =$ _____ %

THE FARMING GAME



Seeding

Type of Farm

If your type of farm will be different from last year subtract 1/4 of ⇨ from last year's production to purchase new equipment.

NON-RENEWABLE RESOURCES

CHOOSE YOUR PATH AND NUMBER WITH THE YEAR

RENEWABLE RESOURCES

MONOCULTURE FARMING	**DIVERSIFIED FARMING**	**ORGANIC FARMING**
One Product.	Many Products.	"Natural" Products.
Appropriate , but large and expensive Farm Equipment.	Appropriate Farm Equipment	Minimal Farm Equipment.
		No Chemicals.

Energy Units

Alternate Energy Sources

-wind
-solar

Power and Fuel Needs

Units

		Energy
High Energy Consumption ⇨	Moderate Energy Use ⇨	Efficient Systems ⇨
Use 5 Energy Units ⇨	**Use 3** Energy Units	**Use 1** Energy Unit ⇨

Note: You may use 1 Unit of an Alternate Energy Source each year. ⇒

Agricultural Chemicals

Fertilizing Your Land

CHOOSE YOUR PATH

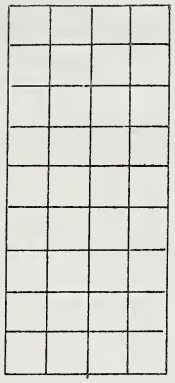
Agricultural Lands

Use 4 Chemical Fertilizer Units ⇨	**Use 2** Chemical Fertilizer Units ⇨	**No** Chemical Fertilizer Used ⇨

REPLACE 1 Renewable Energy Resource Unit

Fold back along dashed line and match to above.

Fertilizer Units



Lose 2 Water Units due to pollution

Lose 2 land units to erosion.

Lose 1 Water Unit due to pollution

Use organic fertilizer.

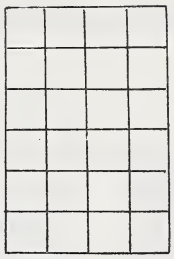
Replace 1/2 of the Chemical Fertilizer used in this year.

Use Organic fertilizer.

Replace 2 Units of land previously lost to erosion

Bonus

Land Units

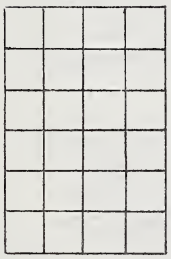


Tillage Methods

CHOOSE YOUR PATH

Zero Tillage	Minimum Tillage	Intensive Tillage
Reclaim 1 Unit of land.	**Lose** 2 Land Units to Erosion	**Lose** 3 Land Units to Erosion

Pesticide Units



Pest Controls (Weeds and Insects)

CHOOSE YOUR PATH

Use 4 Chemical Pesticide Units.	**Use** 2 Chemical Pesticide Units.	No Chemicals Pesticide Used.
Lose 2 Water units due to pollution	**Lose** 1 Water unit due to polution **Lose** 2 to bugs.	**Flip a Coin.** Tails you **lose** 1/2 of this year's crop to bugs.

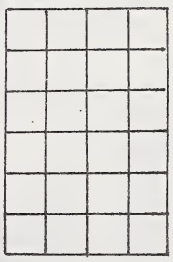
Note: if you already used minimum or intensive tillage as a **physical method** of pest control cut your crop losses to pests in half.

Note: if you use **biological pest controls** you may **reduce** this years chemical pesticide consumption by 1 unit. You must have at least 24 of your original land and water resource units in order to use this method of pest control.

Biological Pest Controls

Water Resources

Water Units

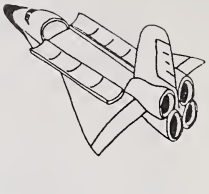


REPLACE 1 Agricultural Land Unit by Reclamation

REPLACE 1 Renewable Water Resource Unit

COUNT YOUR TRUCKS - SUBTRACT LOSSES

Harvest →



MAKING PRODUCTION DECISIONS

Farmers must regularly make important decisions on resource use. This means finding answers every year to questions such as:

- How many cattle should I pasture this spring?
- What should I grow this year?
- When should I plan for my sows to have litters?

On a long-term basis this means answering such questions as:

- How much should I invest in machinery?
- Should I acquire additional land?

These situations all have something in common. As the intensity of resource use increases, revenues will also increase, but eventually at a decreasing rate. For example, the first 10 lbs. of fertilizer will probably increase the crop yield by more than will the same amount after 50 lbs. have already been applied. This is a practical demonstration of the well-known principle of diminishing returns.

Suppose a farmer, John Barleycorn, has taken a soil sample from a field on his farm, on which he intends to grow barley, and has had it tested at the Soil and Animal Nutrition Laboratory. On the basis of nutrient levels in the sample and on previous experimentation, the laboratory suggests that Mr. Barleycorn could expect barley to respond to the addition of nitrogen fertilizer.

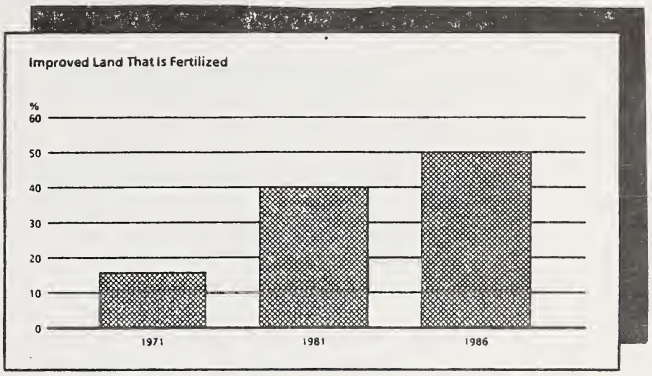
The decision as to how much fertilizer Mr. Barleycorn should apply depends, not only on the response of the barley crop to the nitrogen fertilizer, but also on the cost of nitrogen and on the value of the crop. It makes sense, if the value of the crop is high, to fertilize more heavily than would be the case if the value were lower.

Similarly, it would not pay him to use as much as it would if the cost were lower. As well, John's personal attitude towards risk plays a role.

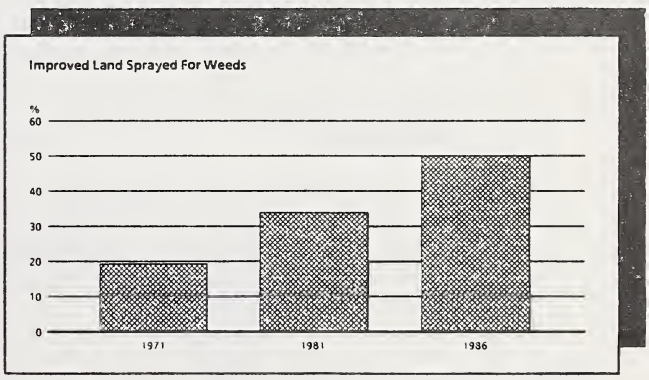
If he were certain about growing conditions, crop yields and prices for the current production year, he would probably feel more comfortable in applying a heavier rate of fertilizer than he would in the case where prices and yields were more subject to variation.

CHANGES IN FARMING PRACTICES

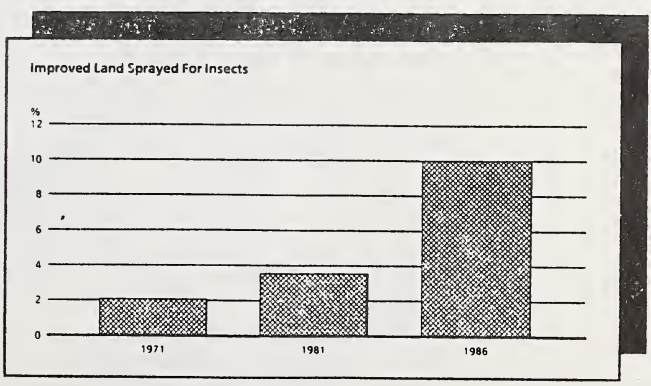
The 1986 Census of Agriculture documents some of the changes in management practices of census-farm operators. In 1986, fertilizer was applied to one half of all improved land. In 1971, only 16 percent was fertilized.



Also in 1986, one-half of improved land was sprayed for the control of weeds. In 1971, 20 percent of improved land was sprayed.

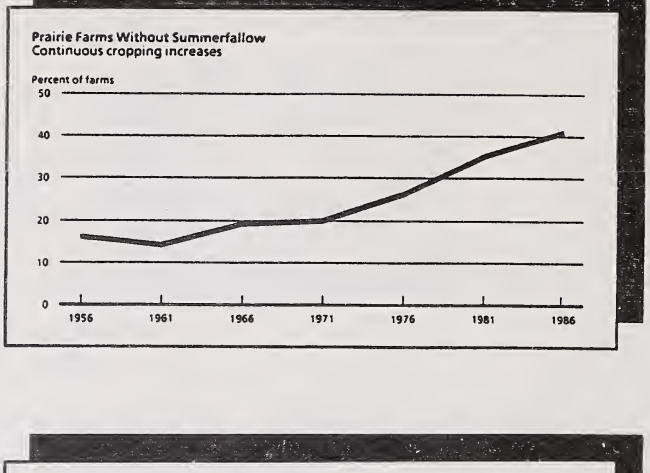


At the national level, 10 percent of improved land was sprayed to control for insects. In 1971, 2 percent of improved land was sprayed to control for insects. A large proportion of the increase in land sprayed for insects was to control the grasshopper infestation in the Prairies in 1985. For example in Saskatchewan in 1986, 6.9 million acres (2.8 million hectares) were sprayed for insect control compared to 1.5 million acres (0.6 million hectares) in 1981.



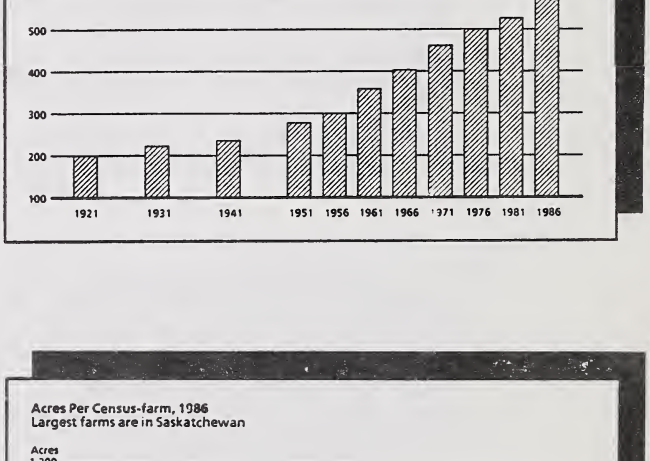
From the Statistics Canada "Daily" of June 3, 1987

Another trend confirmed by the 1986 Census of Agriculture is the tendency towards continuous cropping. In 1986, 41 percent of Prairie census-farm operators reported no summerfallow, up from 20 percent in 1971.

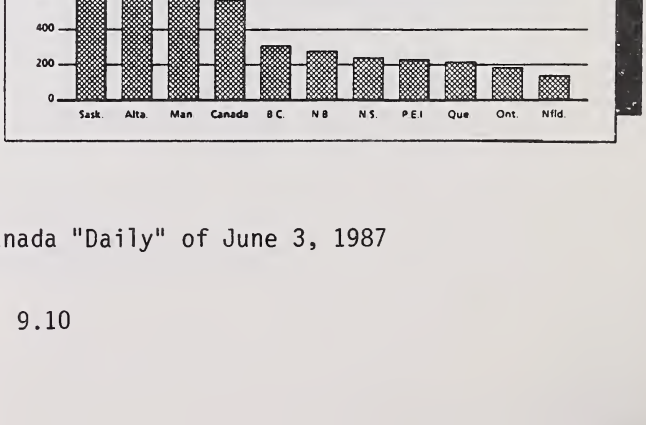


ACRES PER FARM INCREASES

In 1986, total land area per census-farm reached 572 acres (231 hectares). Average farm area has been increasing since 1921.



In 1986, the largest farms were in Saskatchewan, averaging 1036 acres (419 hectares per farm). As with all averages highlighted in this summary of the results of the 1986 Census of Agriculture, an "average-area per census-farm" conceals a wide dispersion in farm sizes within Saskatchewan. In 1986, 14 percent of Saskatchewan census-farms were under 240 acres (97 hectares) and 17 percent were over 1600 acres (647) hectares).



From the Statistics Canada "Daily" of June 3, 1987

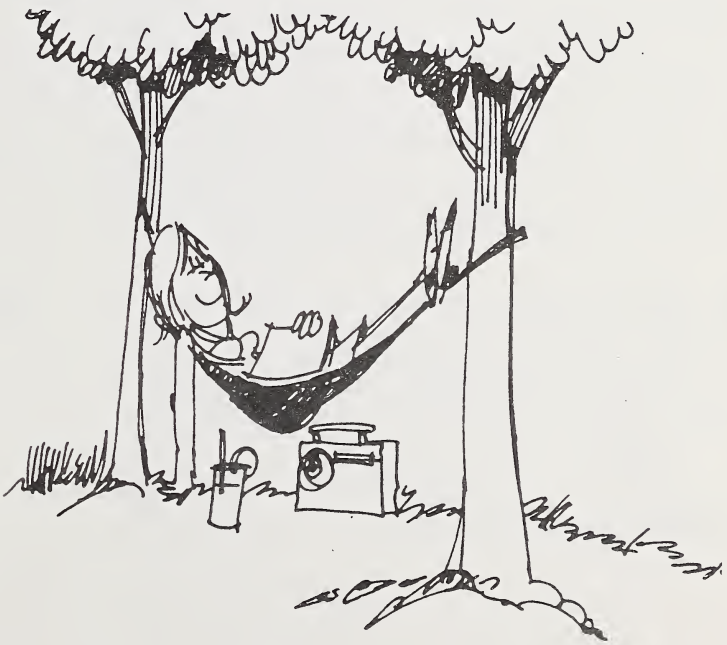
Unit IV: Differentiation of Roles in Agriculture

The three lessons of Unit 4 all deal with the increases in mechanization, specialization and differentiation that have affected agriculture in the twentieth century.

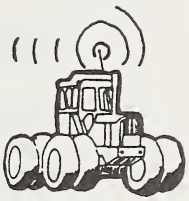
Activity 10 demonstrates how freeing labor from food production allows other industries to develop. The lesson can be applied to either historical or cross-cultural comparisons. In either case students role play food production at varying levels of mechanization.

Activity 11 focuses attention on the rates and times of mechanization in Canada. Students convert tables into graphs, and interpret the connections between three trends working at once.

In Activity 12 your students look at modern food processing. Orange drinks are used as a subject. Students make orange flavored drinks from several starting points and compare the results based on taste, nutrition and cost per unit.



Activity 10



WHAT SHALL WE DO WITH OUR FREE TIME?

Objectives:

Students will conduct a practical demonstration of the effects of mechanization on food production. This lesson will demonstrate how increased productivity in agriculture has freed time and labor for other activities.

Curriculum Fit:

Grade 9, Topic A
Canada: Industrial Development

Growth of Industrialization - Mechanization

Lesson Concepts:

How industrialization affects the quality of life
Growth of industry and mechanization

Agriculture Concepts:

Technology and capital intensity.

Cognitive Level:

Application, Analysis, Synthesis

Materials Required:

1 kg of grain, rice, dried beans or coffee beans
10 mortar and pestle grinders or one round fist-size stone and one larger flat stone
2 mechanical coffee grinders or one meat grinder (with the ability to produce a fine grind)
1 electric coffee grinder or hand blender
hand sieves (2 cm screen)
150 sheets 8½ X 11" paper for houses, planes, and rockets
2 dozen styrofoam cups
6 jars glue or paste
6 pairs of scissors

Time Required:

1 class period

BACKGROUND - For the Teacher

People who live in underdeveloped countries spend a high proportion of their time on food production. Mechanization of farming in the industrialized countries has increased the amount of time and labor available for other activities. Specialization of labor occurs with increased mechanization and industrialization.

In this lesson, the class is divided into three groups representing three different stages of development, each with a different level of mechanization of food production. Food production is simulated by the grinding of coffee. The rate of food production will determine the rate and type of industrial activity for each group. Industrial activity is modelled using paper houses, planes, and rockets.

Through this activity your students should realize that the function of mechanization is to free people for other activities. When this happens in an activity as basic as food production, it makes people available to undertake industrial activities that would otherwise not be done. Further, they should come to realize that, whether we compare contemporary First and Third World countries or historical stages of industrialized countries, the mechanization of farming increases the number and variety of activities and goods available to a society.

You may wish to continue from this demonstration to discussions of diminishing returns, international fairness and the nature of the good life, but these areas lie beyond the topic of this lesson.

As a purely practical matter you may not be able to obtain a hand powered coffee grinder or a meat grinder with a fine enough plate to grind grain. In this case, the activity is just as effective using only the two extreme cases.

WARNING

If you use an electric coffee grinder, be aware that grain is both denser and harder than coffee. The motors of most hand grinders will burn out quickly if students put too much grain in or grind continuously. Limit the amount of grain loaded and instruct students to run the motor in short bursts. This is especially important if you bring your favorite grinder from home.

PROCEDURE

Part 1

Preparation:

1. Purchase the grain or whatever your students are to grind.
2. Obtain hand sieves, mechanical grinders, meat grinders, hand blenders and mortar and pestal grinders.
3. Photocopy the plans for houses, planes and rockets provided with this lesson.

Part 2

Introduction:

4. Explain that food and shelter are basic needs in all societies. People in some countries spend most of their time in satisfying these basic needs.

Part 3

Playing the game:

5. Provide each group with a copy of the procedure and rules of the game supplied. Explain to the class as a whole.
6. Divide the class into three groups and provide them with the following:

   a) Group 1 - 10 mortar and pestal grinders
   b) Group 2 - two mechanical coffee grinders, or one meat grinder
   c) Group 3 - 1 electric coffee grinder or hand blender.

7. Give each group a hand sieve or screen, 2 pairs of scissors, and 2 containers of glue. Ensure that all groups will have access to coffee beans, styrofoam cups, newspaper to catch fines from the sieve, and building materials for houses, planes, and rockets.
8. Set the end point and let the groups start the game. Ensure that all groups follow the rules of the game.

Part 4

Conclusion:

9. Have the class discuss or write down what effect mechanization had on their group, and how they felt about their assignment and about the groups with different amounts of assistance.

FOR DISCUSSION

1. Which group produced the most food, houses, planes?

2. How were tasks distributed in each group? For instance:

   - Which group had the most people involved in food production?
   - Which group had the least people involved in food production?
   - Which group had the most people involved in industrial activities?

3. Which group spent the most time on food production?

   Which group spent the least time on food production?

4. What were people able to do with time not spent on food production?

5. Which group achieved the highest level of specialization of labor?

6. One group produced an excess of food. What could be done with its food production?

7. What is the significance of the rocket in our simulation?

RELATED ACTIVITIES

1. Watch and discuss the film "The Reason Why", available from the Alberta Agriculture Film Library.

2. Debate the resolution "The Good Life is determined by the variety of goods and services produced by the economy."

RULES OF THE GAME

"Mechanization and Food Production"

1. Groups may only use the method of food production assigned to them.

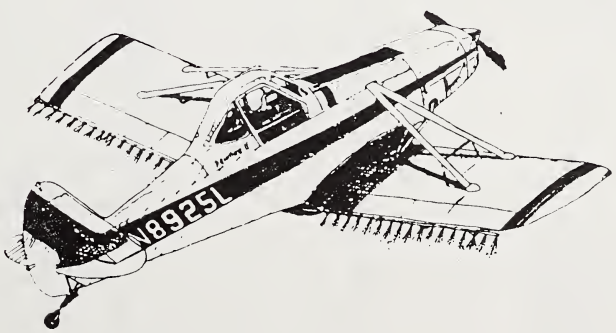
2. Food production is to be given a quality test. The ground coffee must be fine enough to pass through the sieve screen provided. Any courser material must be reground.

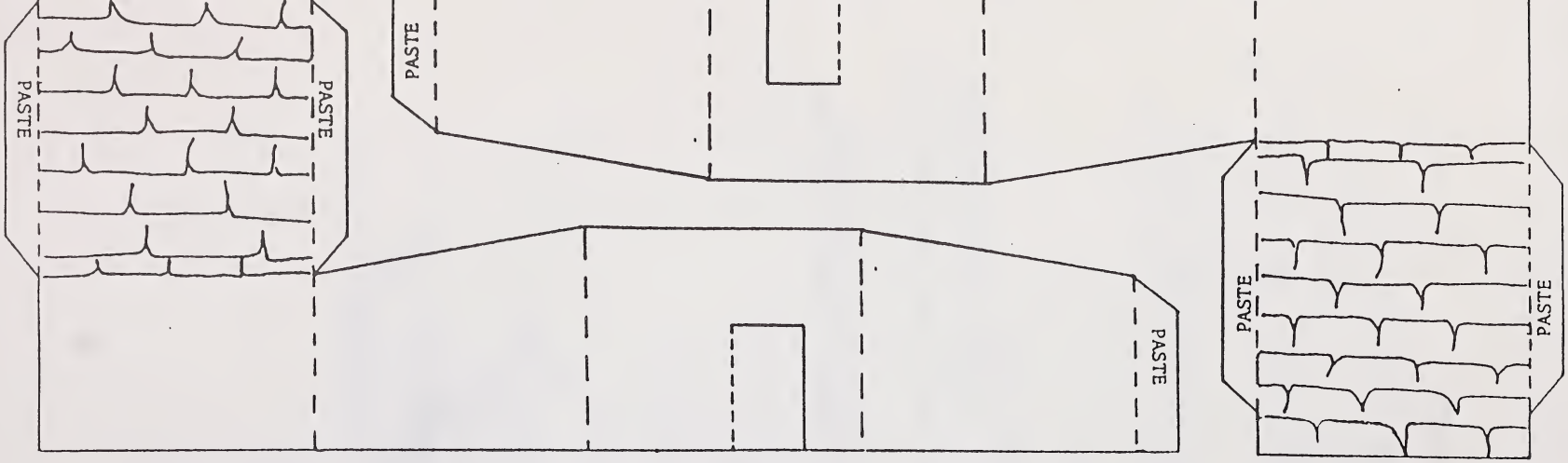
3. As each cup of food is produced your group may begin the next stage of industrial activity according to the following schedule.

   - After 1 cup build 10 houses.
   - After 2 cups build 10 more houses.
   - After 3 cups build 10 more houses.
   - After 4 cups build 10 planes.
   - After 5 cups build 10 planes and one rocket.
   - After 6 cups stop food production - a surplus has been achieved.

   Food may be manufactured continuously until a food surplus (6 cups) is achieved.

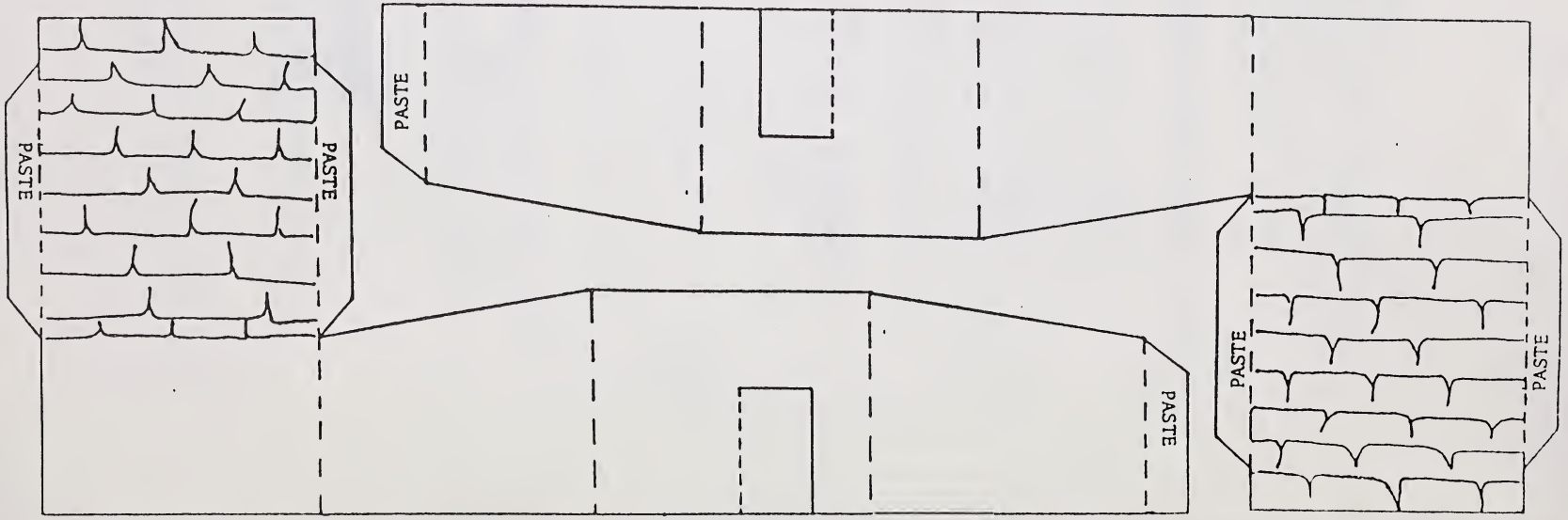
4. So long as your group can keep making food you may assign some members to build houses or planes or rockets. Remember that food and shelter are essential to life.

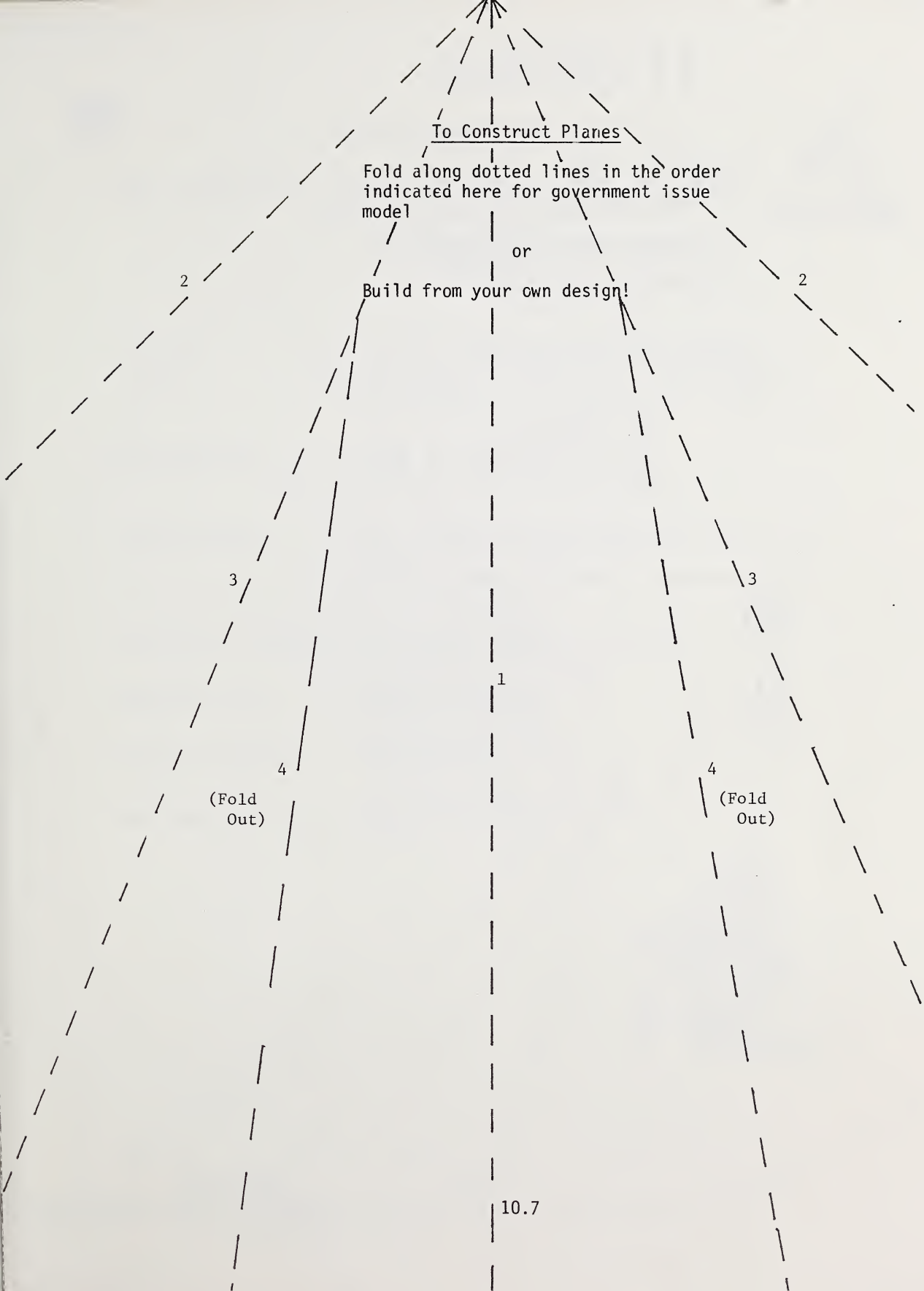




To Assemble Houses

1. Cut along solid lines
2. Fold along dotted lines
3. Apply paste where shown
4. Assemble as shown




To Construct Planes
Fold along dotted lines in the order indicated here for government issue model
or
Build from your own design!
2
2
3
3
1
4
4
(Fold Out)
(Fold Out)
10.7

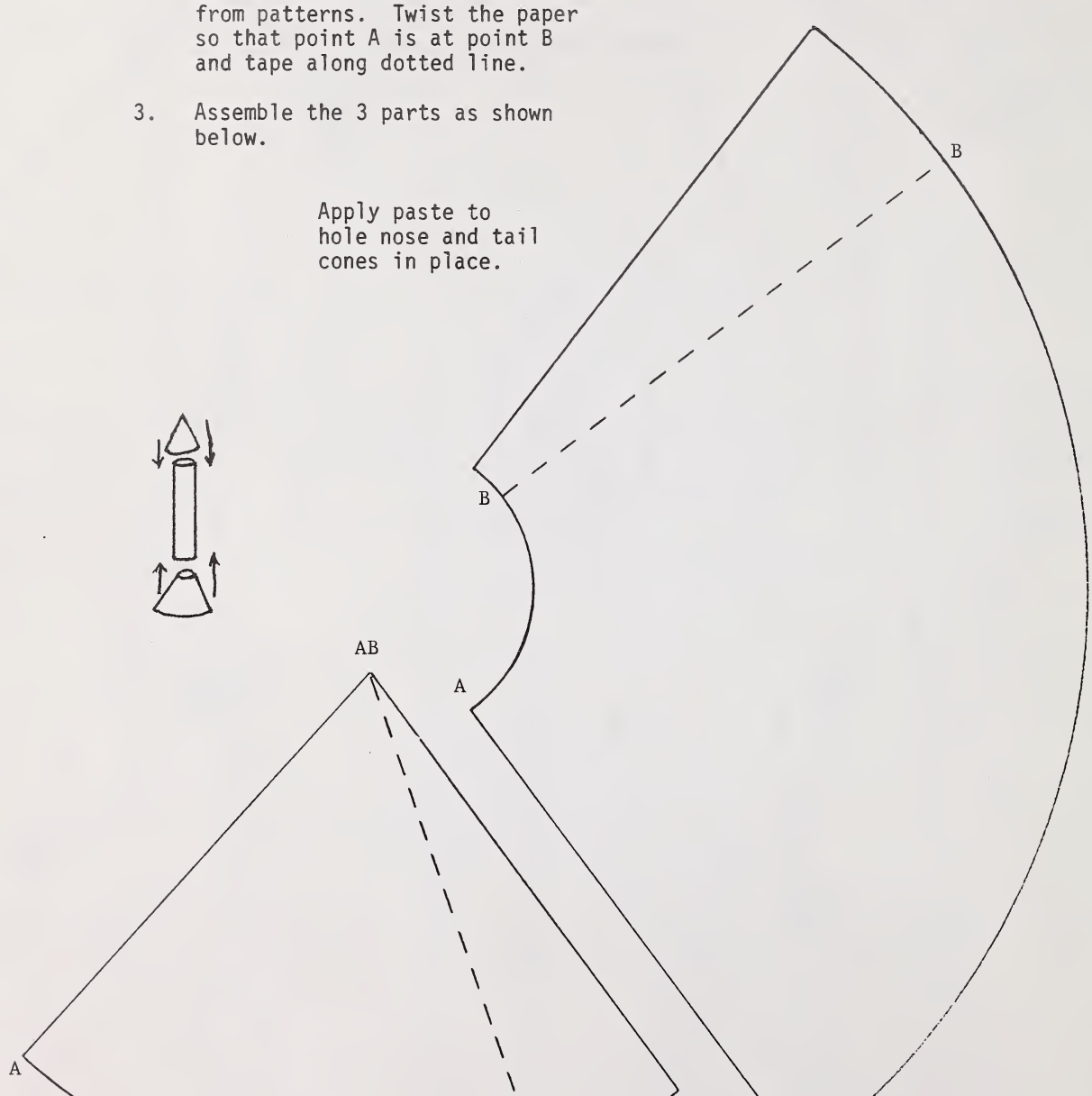
To Construct a Rocket

1. Make the body tube by rolling a sheet of 8½" x 11" paper to form a tube 8½" long and 1.2" across the diameter. Tape along the edge with transparent tape.

2. Assemble nose cone and base cone from patterns. Twist the paper so that point A is at point B and tape along dotted line.

3. Assemble the 3 parts as shown below.

Apply paste to hole nose and tail cones in place.



Activity 11

THE CANADIAN HISTORY OF FARM MECHANIZATION

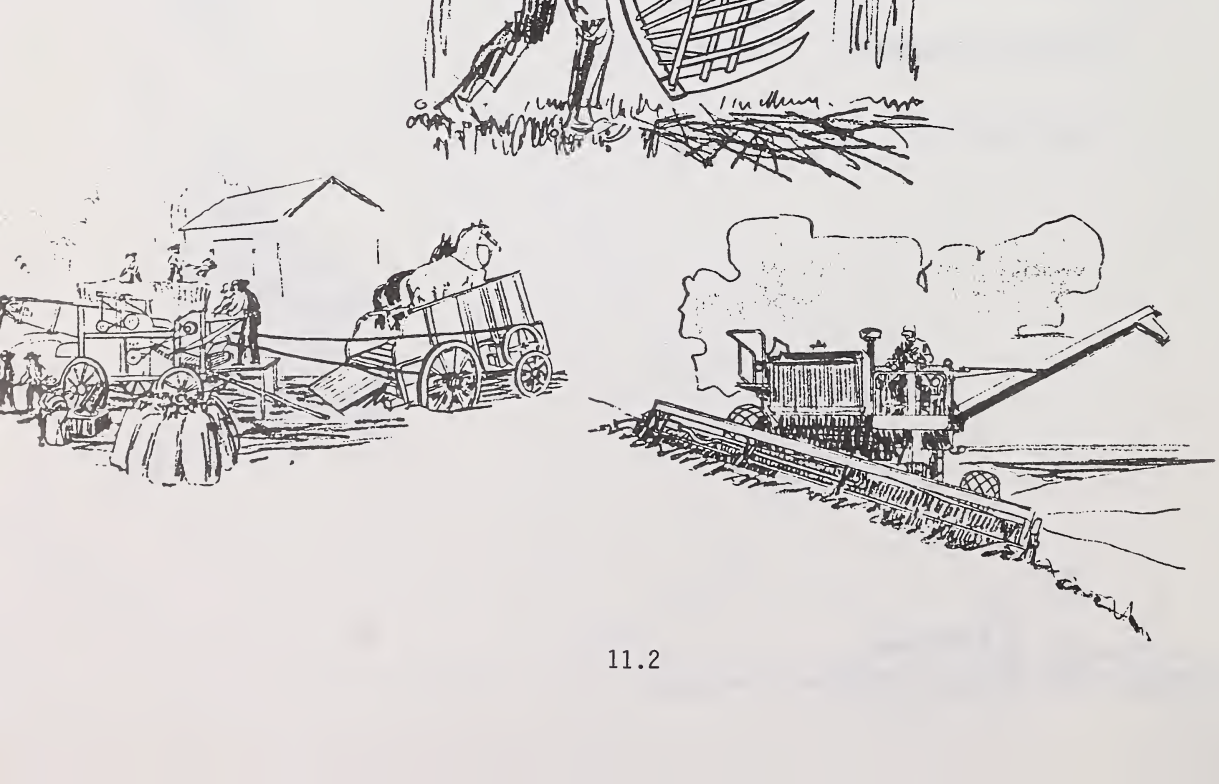
Objective:	Students will relate their discoveries in Activity 10 to statistics on food production and mechanization in Canadian agriculture
Curriculum Fit:	Grade 9, Topic A Canada: Industrial Development
Lesson Concepts:	How industrialization affects the quality of life Growth of industrialization and mechanization
Agricultural Concepts:	Technology and capital intensity
Cognitive Level:	Analysis, Synthesis
Materials Required:	graph paper
Time Required:	One class period

BACKGROUND - For the Teacher

Mechanization of human endeavour was the main result of the Industrial Revolution of the eighteenth and nineteenth centuries. Jethro Tull's seed drill in 1740, Eli Whitney's cotton gin in 1794 and John Deere's steel plow of 1837 were all early applications of this process to agriculture. Throughout this era, dozens of inventions and hundreds of refinements helped to mechanize agriculture.

Farm mechanization increased with invention of the steam tractor about 1880, followed by the gasoline tractor in 1906. In 1917 the introduction of power take-off increased the flexibility of the tractor as a mobile power source for a variety of farm equipment. Reduction in weight and the introduction of rubber tires increased speed and mobility.

The data in this lesson illustrates the increase of farm equipment use in Alberta. Tables 2 and 3 allow students to correlate the increase in mechanization with increases in farm productivity and decreases in direct farm labor.



PROCEDURE

Part 1

Introduction:

1. Review the findings of Activity 10 about the relation between agricultural mechanization and economic diversity, and explain that today they are to look at what has happened in Canadian agriculture in the last 100 years.

Part 2

The activity:

2. Distribute copies of data sheets 1 and 2 to your students.

3. Ask students to graph the data shown in the tables above.

Part 3

Conclusion:

4. With the class, develop an explanation of how the increases in food production relate to the decrease in the use of farm labor.

FOR DISCUSSION

1. Agricultural productivity can be increased by other means in addition to mechanization. Can you think of several other technological advances in agricultural since the industrial revolution?

2. Where did people move to when they were no longer required for food production.

3. What are some alternative activities related to agriculture which now employ these people?

4. What are the financial demands placed on the farmer by increased mechanization?

5. What problems does this present for the future of Agriculture?

RELATED ACTIVITIES

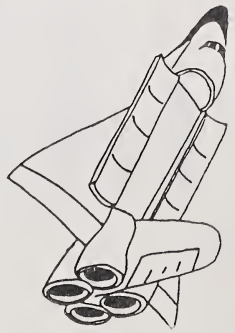
1. Have students develop a sales pitch to convince a 1948 farmer that he should replace his team of horses with a tractor and combine.

2. Have students develop a sales pitch to convince a 1987 grain farmer that he should sell his large machinery and replace it with a 2-horse team, simple machinery and a hired man.

DATA SHEET 1

TABLE 1: Growth of Farm Mechanization in Alberta
1926 - 1981

	1926	1931	1941	1951	1961	1971	1981
Tractors	11,311	23,985	36,445	79,282	102,624	111,256	124,214
Grain Combines	--	2,523	5,165	20,852	38,530	42,373	42,663
Grain Binders	N/A	73,487	N/A	57,930	32,476	--	--
Threshing Machines	N/A	12,457	12,753	14,768	13,006	--	--
Trucks	1,421	7,319	14,512	39,723	71,508	93,421	123,835



DATA SHEET 2

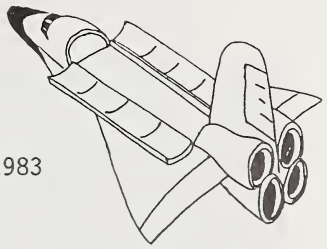


TABLE 2: Farm Productivity from 1885 - 1983

Number of person fed per/farmer

1885	2 per farmer
1955	20 per farmer
1965	37 per farmer
1983	67 per farmer

TABLE 3: Farm Productivity from 1881 - 1980

Percent of population directly employed in farming

1885	50%
1955	45%
1965	20%
1960	11%
1980	4%

Cultivating a field with an early tractor.

Cultivating a field with modern implements.

Cutting and windrowing grain with a swather.

Combining today.

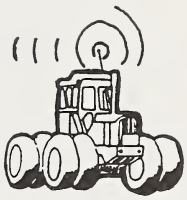
Storing feed in big round bales.

Harvesting feed to store as silage.

A good way to spray a small field.

Loading an airplane for aerial spraying.

Activity 12



CHANGING FOOD AND CREATING FOOD

Objective:

In this lesson students will consider the history of food processing, the social impact of new technologies, and the economic importance of the food processing industries. Students will identify the objectives of the industry through a number of practical activities.

Curriculum Fit:

Grade 9, Topic A or Topic B
Canada: Industrial Development
U.S.A.: Industrial Development

Lesson Concepts:

The varied effects of industrial development on our quality of life

Agriculture Concepts:

Production, Processing, and Distribution System
Economic importance of agriculture
Diversity of agriculture

Materials Required:

Kitchen or lab facilities for practical exercises in food processing

- 1 pkg. orange flavor crystals
- 20 Vitamin C tablets
- 1 container of frozen orange juice concentrate
- 12 fresh oranges
- citrus juicer
- 4 containers, each 1 litre or larger
- price information for all ingredients
- disposable paper cups (very small)
- copies of the rating sheet

Reproductions of Information Sheet (optional)

Time Required:

1 - 3 class periods

BACKGROUND - For the Teacher

> NOTE: This lesson contains several supplementary activities at the end.

Processing has been a part of food production since ancient times. Sun drying, smoking and salting began in the prehistoric times. Fermentation of grains is at least 8000 years old. People have milled flour and baked bread for 5000 years; they have made cheese and yogurt for almost as long.

In recent years, as the farm population becomes smaller and more productive and the urban population has become larger and more demanding, the processing of food has become an industry itself. Prolonged storage life, increased palatability, increased nutrition, and simplified cooking procedures are major goals for consumers. Low production cost, ease of quality control and easy marketing are important to processors. As these forces for increased processing have been satisfied, concern over the long term health effects of these highly altered foods have developed among some consumers.

The activities are recommended as practical examples of the purpose of food processing. An appreciation of how choices are made in the industry will help students make more informed choices as consumers.

By using all the alternate activities the class can work in more effective groups. The conclusions from each group can be used in an active comparative discussion.

PROCEDURE

Part 1

Introduction:

1. Ask students to make a list of all of the kinds of orange flavored drinks they know.

2. Explain that in this lesson they are to see how different kinds of drinks are made and why.

Part 2

Making the Drinks

3. Divide the class into three working groups. Each group will make one of the orange drinks below.

4. Tell Group 1 to:

   a) make 4 litres of presweetened orange flavor crystals.
   b) divide the result into two 2 litre containers.
   c) add several Vitamin C tablets to 2 litres of the above to increase the nutritional value.
   d) determine the amount of Vitamin C found in a 250 ml serving.

5. Tell Group 2 to:

   a) make up a 32 oz. container of frozen orange juice from concentrate.
   b) add about 110 ml of frozen orange juice from a) above to 1 litre of the orange drink with vitamins from Group 1. Real orange juice will make up less than 10% of the total volume of your mixture.
   c) Retain the remainder of the reconstituted frozen orange juice for test purposes.

6. Tell group 3 to:

   a) squeeze and strain the juice from 12 fresh oranges.
   b) measure the volume of juice and of pulp obtained.
   c) calculate the number of oranges required and the cost of producing a litre of fresh orange juice.

Part 3

Testing the Drinks:

7. Ask each student to rate the products for color, texture, and taste on the sheet provided.

8. Working with the whole class, calculate the cost per litre and amount of Vitamin C per litre from the packaging or other sources.

Part 4

Conclusion:

9. Which drink was most popular for taste.

10. Which drink provided the most Vitamin C for the lowest cost per litre.

FOR DISCUSSION

1. What are the advantages and disadvantages of artificial food substances?

2. What are the advantages of nutritional food additives.

3. What are the advantages of natural food additives.

4. What are the benefits of processed natural foods?

5. What are some concerns about processed natural foods?

6. What are the advantages and disadvantages of natural foods?

7. How do people make the purified, stable, Vitamin C that is contained in Vitamin tablets? What else makes up the tablet?

RELATED ACTIVITIES

1. Read and discuss the Did You Know Data Sheet.

ALTERNATE PROCEDURES

1. Improve Flavor Using an Additive

   Make a pancake syrup from brown sugar and water by mixing sugar in warm water and allowing to cool to room temperature. Taste your mixture. Then add artificial maple flavoring and retaste the mixture. Rate the quality of your product.

2. Compare Different Processes to Preserve Fruits and Vegetables.

   Test two methods of food preservation on:
   - peas (shelled)
   - carrots (sliced to discs)
   - apples (sliced and peeled)
   - apricots, plums, and grapes (whole)

   a) Method 1 - Sun dry, oven dry, or use a fruit drier (if available)
   b) Method 2 - Blanch in boiling water for 3 to 5 minutes. Then freeze on a flat cookie sheet.

   Rate the processing methods.
   Reconstitute the same products by boiling.

   Use the taste test from this lesson to rate the quality of the reconstituted food as compared with a control sample prepared from fresh produce.

   Tabulate your results in a manner similar to the data sheet provided.

   Which methods produce the most satisfactory end product for ease of storage?

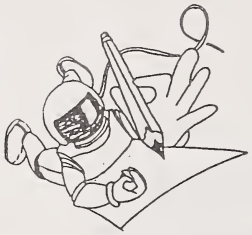
   Which method produces the most satisfactory product for taste and natural texture when reconstituted?

3. Produce whole wheat flour from raw wheat using a blender.

   Shorten the time in the blender to produce a whole wheat cereal. (A similar method is used to prepare the famous Sunny Boy Cereal!)

   Experiment with several types of cereal grains and manufacture several blends.

   Taste and rate the quality of your products. Suggest improvements such as varying grain mixtures or using fruit additives.

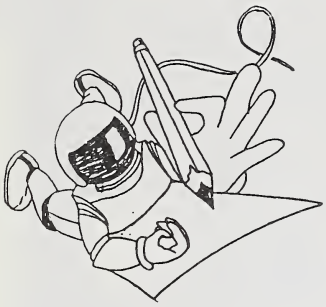


RATE YOUR PRODUCT

Use a rating on a scale of: poor (1) to excellent (5)

PRODUCT NAME	FLAVOR	TEXTURE	COLOR	COST (per litre)	VITAMIN C (per 250 ml)	TOTAL SCORE
Flavor Crystals						
Fortified Flavor Crystals						
Fortified Flavor Crystals with 10% Real Juice						
Frozen Orange Juice						
Natural Orange Juice						
THE HIGHEST OVERALL RATING GOES TO:						

Put a checkmark in each box that includes an example of food processing.



Planting seeds

Baking bread

Feeding cows

Brewing ale

Churning butter

Drying fruit

Picking potatoes

Spraying weeds

Smoking fish

Adding color

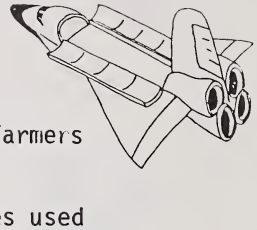
Canning stew

Making potato chips

Eating supper

Adding sugar

Food processing includes all of the activities that change animal and vegetable raw materials into more palatable and usable food sources.



THE HISTORY OF FOOD PROCESSING

The early history of food processing involved individual farmers and craftsmen. For example:

> Before written history, people living in cold climates used freezing to preserve meats. Sun and air drying of grains, beans, and fruit are ancient practices. Fermentation by brewing is at least 8000 years old; hops was added for flavor by 1000 B.C.
>
> Evidence of grain milling and the bread baking is obtained from cakes excavated in Europe which are over 5000 years old. The Egyptians made leavened wheat breads by 2600 B.C.
>
> The earliest dairy products were cheese and yogurt, first developed in Asia. Ice milks were produced by the Chinese over 1000 years ago and eventually brought to Europe by Marco Polo.

AN INDUSTRY DEVELOPS

The second stage of food processing did not come until the 19th Century. Introduction of mechanical methods in factories allowed production of large quantities of food of uniform quality. Canning, refrigeration, and chemical preservation (except using salt) have all been invented since 1800.

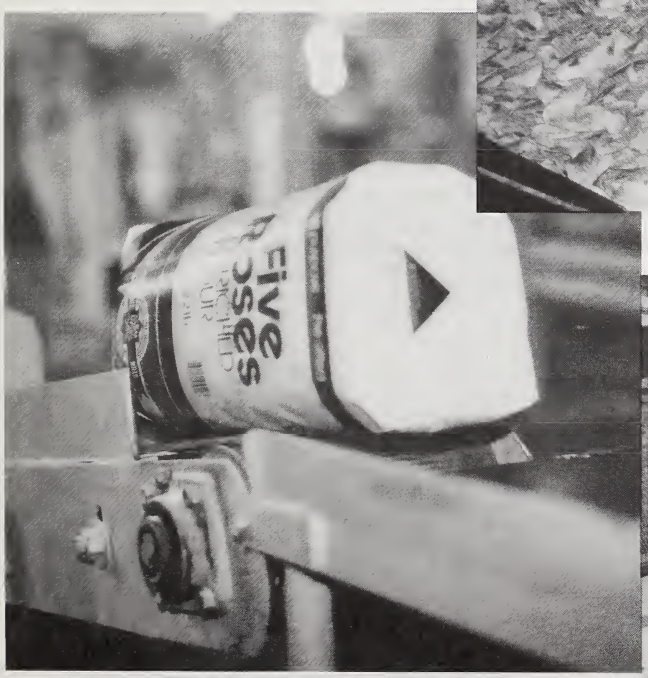
The third stage in the evolution of food processing brought automation to food production and packaging. Chemical additives became increasingly important as a means of improving flavor and shelf life. The twentieth century has also created a demand for convenience foods with processing reducing the time and effort required to prepare food for consumption.

Prior to the middle 1800's food processing was not an industry. These industries developed due to a transfer of food processing functions from the farms, kitchens, markets, and stores to factories. A relatively small and widely scattered population limited the demand for packaged foods. The market for non-manufactured foods was greater than for manufactured foods until the 1870's. By 1900, however, the demand for processed foods was twice that of unprocessed foods.

Rapid growth in the food industry was the result of a number of factors. Factories were able to reduce the cost of many foods by specialization and mass production. Urbanization and better transportation enabled factories to service large markets. A wider variety of new packaged food products has an ever expanding worldwide consumer market.

While the food processing industry grew, new corporate empires developed. Many of the brand names that are found on Canadian shelves originated during the period from 1870 to 1900. Most corporations grew by the merging of many smaller companies. Advertizing and brand name recognition became important. Marketing is now a sizable portion of the corporate budget in all food processing companies.

Processing in the four food groups.



AND WHAT'S NEXT?

A fourth stage is about to begin. Biological industrial processes are now capable of producing synthetic nutritious food substances which may resemble natural foods or may remake natural substances into an entirely different form. Consumer acceptance of these products will depend on the quality and price advantages which they present.

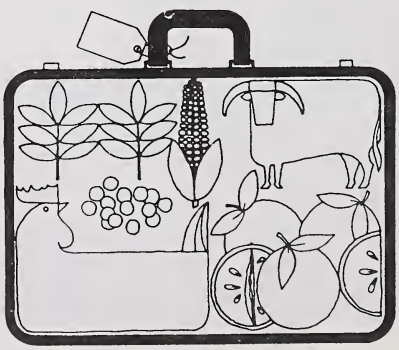
The food processing industry is becoming increasingly competitive. The demand for a product is heavily dependent on advertising and brand recognition. However, consumers have also expressed a desire for nutritious, palatable, high quality products at low cost. New technologies enable more careful study of the relationship between diet and health. As a result, research in the food sciences have moved in a number of new directions.

There has been an increased in demand for non-additive foods. Additives are often used to improve color, texture, and flavor of processed foods to make a product more appealing or replace what has been lost during preparation of natural foods. Special processing techniques and methods of preservation may make many of the chemical additives unnecessary.

You may have noticed an increasing number of convenience foods and stores. Ready to eat foods demand long shelf life. New techniques such as vacuum packaging in nitrogen increase the shelf life of a sandwich to as long as 45 days.

Another method of improving storability of food is irradiation. This method involved exposing food to a low energy source of gamma radiation. Gamma radiation stops cell growth in fruit, vegetables, insects, or bacteria by breaking down the cell molecules which control cell division in living organisms. Low levels of exposure will allow fruit to be stored without refrigeration, and will prevent germination in potatoes (the sending out roots and shoot). Higher doses will destroy bacteria in fish, poultry, and meat.

This technique has been available for almost 40 years, but cost, controversy, and mistrust by the public, have slowed the introduction of these methods on a large scale. Also, the level of radiation necessary to kill most bacterial organisms can effect nutrition, flavor, color, and texture of food. It does <u>not</u> make exposed food radioactive but may produce unwanted chemical changes. Canada is a leader in the development of this technology, but the U.S. is currently ahead of Canada in approving it's use for treatment of certain foods.



Another effect of increased competition in the food industry is increased use of cost-reducing technologies such as robotics and the bio-technologies. A recent development in bio-technology involves the production of fructose sugar directly from indigestible cellulose. The process uses a synthetic enzyme similar to enzymes produced naturally, by bacteria or protozoa in the stomachs of ruminants. These enzymes enabled cows to utilize the energy stored in cellulose which is the major component of grasses. Commercial sugar production using this process will eventually be less expensive than sugar production from sugar cane or sugar beat farming. This will have serious implications for these industries.

Reduction of waste is another cost reducing method. For example, the major waste product from cheese production is a high protein substance called whey. At present, only half of the whey produced is used for food or livestock feed leaving almost a million tons to be disposed of annually. Research is currently looking for a means to restructure this product for human consumption.

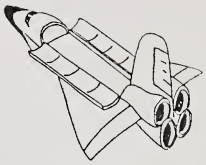
Another important trend is the conversion of low value food ingredients to high value food ingredients. Chicken nuggets, instant foods, and frozen french fries are only a few examples.

The Economic Importance of Food Processing

Food processing is important because the value of materials for export is increased if they can be exported as a processed finished product rather than as raw materials. The following tables illustrate the effects of processing on employment and the important contribution of food processing to gross national product of the U.S.A. The direct benefits to an economy are increased employment and greater income from resources.

Similar benefits can also result from an expanded food processing industry in Canada. This would be of special benefit to Western Canada which is an important supplier of raw materials to food processing industries elsewhere.

DID YOU KNOW?



1000 T of feed corn → EXPORTED → $220,000 and 3.1 person years of work. value

Fed to poultry

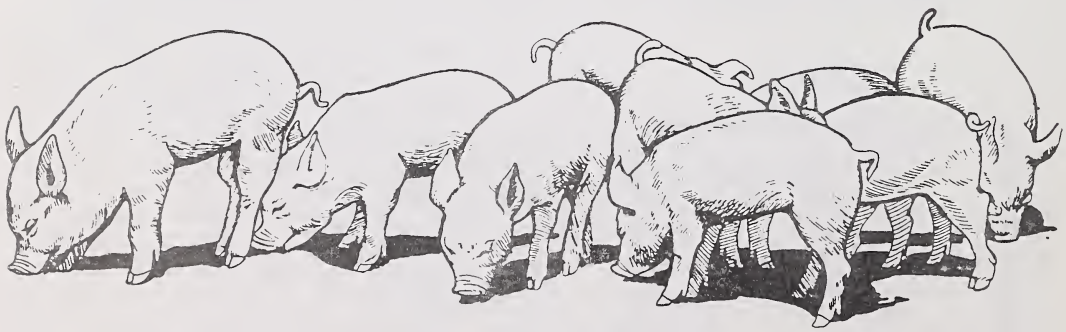
335 T poultry → EXPORTED → $825,000 and 5.6 person years value of work.

fed to pigs

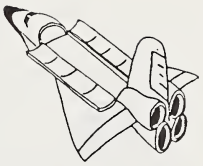
250 T pork → EXPORTED → $1,200,000 and 6.8 person years value of work.

processed and packaged

300 T packaged meat → EXPORTED → $1,750,000 and 8.5 person years value of work.

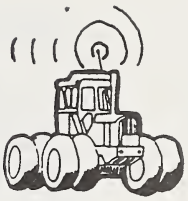


DID YOU KNOW?



1000 T of wheat	EXPORTED	$295,000 and 4.5 person years value of work.
Milled		
740 T of flour	EXPORTED	$ 490,000 and 5.8 person years of value of work.
baked		
600 T of bakery products	EXPORTED	$1,350,000 amd 11.7 person years of value of work.

Activity 13



STARTING NEW BUSINESSES IN AGRICULTURE

Objective:	In this lesson students are presented with information and histories of two new businesses. Students identify attitudes that contribute to the success of a new enterprise using a series of discussion questions.
Curriculum Fit:	Grade 9, Topic A Canada: Industrial Development
Lesson Concepts:	Extent to which individuals influence industrialization Role of government in the industrial development Role of business in the growth of industrialization
Agricultural Concepts:	Production, processing and distribution system Diversity
Cognitive Level:	Comprehension, Analysis, Synthesis, Application, Evaluation
Materials Required:	Reproduction of information packages
Time Required:	Two class periods

BACKGROUND - For the Teacher

This activity includes the stories of how two real businesses in the agriculture sector began. Each situation illustrates the way entrepreneurs think and act. We have added a set of discussion questions to each description in order to help your students analyse what happened in each case.

Students using this lesson should begin to understand the role of entrepreneurship in the Canadian (or U.S.) economic system. They will also see a case in which a government agency influenced entrepreneurs, and a case in which one abandoned industrial activity affected the success of a later one.

Activities 14 and 15 provide opportunities to develop this theme further.

PROCEDURE

Part 1

Introduction:

1. Ask your class to define "problem" and to tell how they feel problems should be dealt with.
2. Explain that in this activity they are going to read about two different problem solvers and how they developed business out of problems.

Part 2

First Case Study:

3. Have your students read the information for Case Study 1.
4. Discuss the events described, using the DISCUSSION QUESTIONS as a guide.

Part 3

Second Case Study:

5. Have your students read the information for Case Study 2.
6. Discuss the events described using the DISCUSSION QUESTIONS as a guide.

Part 4

Conclusion:

7. Ask students to decide on one sentence that describes how entrepreneurs deal with problems.

FOR DISCUSSION

Case Study 1:

1. What problem became the "seed" that grew and flourished in one man's fertile mind?

   What does this tell us about problems?

2. This enterprise is an example of a research project involving an application of new technology. Such research is necessary for the development of new industries.

   Why is the risk to the investor in such a venture much greater than in an ordinary business?

3. It has been argued by some that the idea of large scale hydroponic gardening is not new, and has failed in the past, mainly for economic reasons: as greenhouses become too large they usually become less efficient. Sprung set out, armed with the latest technology, to prove that his system could work.

   Do you think that Mr. Sprung might find such criticism useful or a hindrance.

4. Sprung overlooked an important factor when locating his business. Does this mean that his ideas are flawed and the experiment is a failure?

5. Clearly, not everyone was put off by the misfortune which occurred to his new enterprise. What are some of the factors which will enable Mr. Sprung to try again?

6. What justification is there for governments to provide financial help to this new industry?

7. Government assistance is an important aid to new businesses. However, at some point, this help should end.

   Should a government provide financial help to this type of business?

8. At what point should a government stop providing financial aid to a new business?

9. In the end, what are the most important personal qualities and attitudes of an entrepreneur?

FOR DISCUSSION

Case Study 2:

1. One of the characteristics of modern industry is increasing government involvement in business. List the ways in which government helps to establish or regulates this new business.

2. Did government involvement consist of mainly financial support?

3. Should a government provide direct financial support for this type of business? Why or why not?

4. There is usually less risk to an entrepreneur when taking over an established business. What are some of the reasons that this is so?

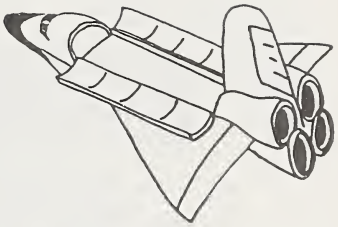
5. There is, at present, a very protectionist mood in the United States which means there is considerable opposition to "cheap" foreign imports. Also, advocates of free trade would argue that such subsidies are unfair and should be abolished. Do you think that a free trade agreement will hurt this business if the government is forced, by agreement, to eliminate all government subsidies (such as the subsidy on exported flour mentioned above)?

RELATED ACTIVITIES

1. Activities 14 and 15 of this book.

2. Generate business ideas that the class could carry out to raise funds for a special project.

3. Investigate what entrepreneurial efforts have begun in agriculture in Alberta and vote on the top ten.



CASE STUDY 1: The Sprung Enviroponics Story

Information Package

THE FERTILE MIND OF PHILIP SPRUNG

How one man's idea turned thistles into a winter harvest of fruit.

- Excerpted from the Alberta Report, September 8, 1986.

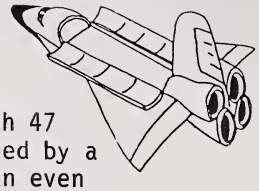
If genius is the knack of turning a hindrance into an advantage, then Calgarian Philip Sprung, 55, is surely a genius. Ten years ago he began pondering what might be done about the pesty weeds which rose with unusual vigour inside the translucent, tent-like "instant structures" his company sells around the world. But where most men would think of herbicides, Mr. Sprung began wondering what might make the weeds grow better. This summer he announced the result: Sprung Environmental Space Enclosures. The technology involved in this steamy, Amazonian, computer-controlled $35-million innovation, he says, will make each region of Canada self-sufficient in fresh produce year-round and is now being sold around the globe.

An inventive entrepreneur who shuns the limelight, Mr. Sprung once remarked to a banking acquaintance he believes his job is to help shelter, feed and clothe the world. To a remarkable extent, says the banker, Mr. Sprung has succeeded. His family interests comprise Western Tent and Awning Ltd., founded in Calgary by his grandfather in 1887; Sprung-Clindinin Ltd., a ski-wear manufacturer; and Sprung Instant Structures Ltd., founded and developed by Philip Sprung to produce low-cost shelter.

It was the shelter technology that led directly to the greenhouse idea. When he began investigating the phenomenon of weed growth he found that "within the light spectrum there are certain things that promote plant growth. Instead of stopping it, we went the other way and developed a refracted, diffused, magnified light." He's wary of discussing exactly how the canopies to his Sprung structures are processed to permit this enhanced light, even though he says the technique is covered by one of the 18 worldwide patents protecting his invention.

Step by step he planned and perfected the Calgary experiment. It's now made up of eight high-vaulted, 400-foot Sprung structures radiating from hub like spokes on a wheel.

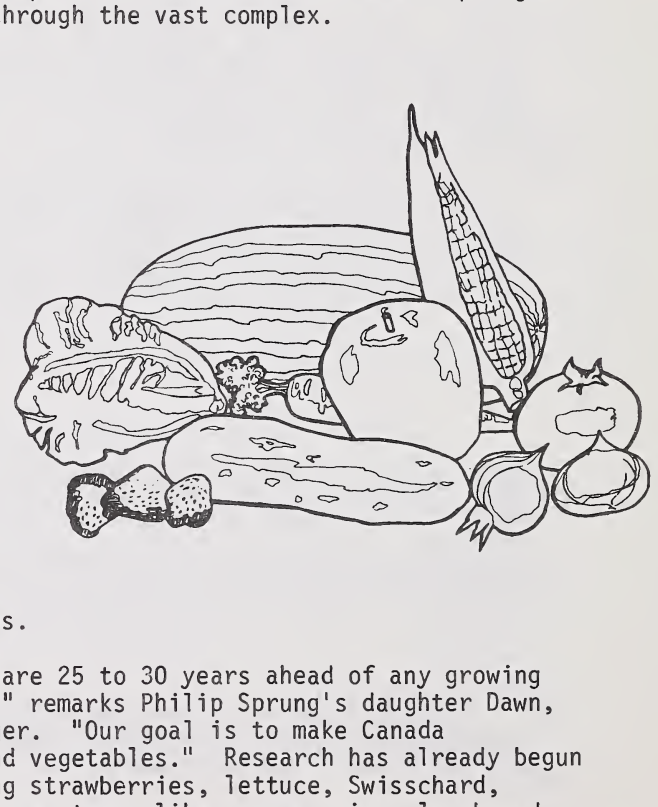
He refers to each as a "production zone", and explains that conditions within each such "macro-environment" are monitored constantly by temperature, humidity and carbon dioxide sensors linked to a central computer system. Each growing zone is sealed against diseases, insects



and weather - even hail and January frost. Each is heated with 47 home-size furnaces; this minimizes the risk of damage occasioned by a single mechanical failure. The overall effect is to deliver an even quantity of light and heat to all plants.

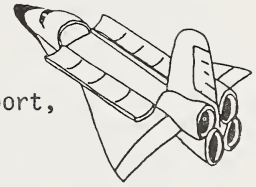
Into this contrived Eden he has introduced a system of optimum nutrition. To date he has restricted his main experiments to cucumbers and tomatoes, both of which can be grown on vines climbing up to 15 feet high. They begin as seedlings springing from small fibre-nutrient blocks. They are then moved into long plastic trays and fed a solution of liquid nutrients. Sensors monitor the flow rate, temperature, oxygen content and acidity in the water, and technicians regularly test the levels of 15 elements used in varying quantities during maturation. All these data are fed into the central computer system. If anything violates the plan, either in the nutrients micro-environment around the plants' roots or in the macro-environment overhead, the central computer sends a signal to beepers worn on the belts of the technicians in charge. They rush the trouble spot on the electric carts Mr. Sprung's 150 employees used to travel through the vast complex.

Since last December, shoppers in Edmonton and Calgary have been buying everything the hothouse can produce. Sold under the Sante 7 label, it arrives at the wholesaler the day it's picked. Occupying only 8.5 acres of land - in fact, the former site of the Imperial Oil refinery on Ogden Road - it produces about eight million cucumbers or tomatoes annually. This translates into 38,000 individual tomatoes a day, or 22,000 cucumbers. Cucumbers can be picked within six days of first flowering. The company is reticent about its production time on tomatoes.



"We've been told that we are 25 to 30 years ahead of any growing technology in the world today," remarks Philip Sprung's daughter Dawn, 27, Enviroponics general manager. "Our goal is to make Canada import-free in fresh fruits and vegetables." Research has already begun into the feasibility of growing strawberries, lettuce, Swisschard, melons, asparagus, roses, and even trees like spruce, pine, larch and elm. Commercial success of all these, says Miss Sprung, is still unproven."

. . . original article continues . . .



SPRUNG'S NEWLY BARREN GARDEN - Excerpted from the Alberta Report, April 6, 1987.

The chance to create 300,000 Canadian jobs is being strangled by pollution from the site of the old Imperial Oil refinery on Calgary's Bow River flats. Until recently, the extraordinary vegetable-growing factory of Philip (Phil) Davis Sprung, 55, employed up to 180 people. And Sprung Enviroponics officials estimate Canada could support 2,000 such greenhouse complexes. But last week only nine workers were tending the prototype Calgary operation. Warns a desperate Mr. Sprung: "We're out of money. We're running out of time."

The six-foot three inch entrepreneur, whose cherubic face and penchant for handing out vegetables to visitors have earned him the nickname "Jolly Green Giant," reveals production totals that have stunned the horticultural world. The 8 1/2 acres now under translucent plastic can grow seven million cucumbers or ten million tomatoes a year - half again the output of conventional greenhouses. Since its inauguration into the fall of 1985, its vegetables have been sold on a commercial scale as far away as Montreal. Successful tests have been run on 47 crops, from red peppers to fruit trees. Laments Mr. Sprung: "We've broken through the technical barriers only to trip going into the main stretch."

So far he has sunk $35 million into the project, including $13.5 million on constructing the present prototype, but now negotiations to build six more greenhouse complexes are stalled (and very possibly killed) due to news of a massive failure. The cause: some 190 hydrocarbons seeping out of the fouled earth upon which the complex is built. They turned the produce black. Yet Mr. Sprung insists he has yet to begin litigation. "I'd far rather settle out of court for enough money to get restarted than win $300 million, years from now when it is much too late to save this company. I did not get into business to conduct lawsuits."

He warns: "Unless we can move our plant away from the old refinery site, we can not generate new cash flow to maintain our research program. In that case, we won't be able to hold the international lead in this technology. Our competitors are already working day and night to close the gap. Some of our laid-off staff are being hired away. And many of our competitors are not Canadians."

PROVINCE SEEKING WAYS TO KEEP SPRUNG GREENHOUSES IN ALBERTA

Excerpted from the Calgary Herald, May 12, 1987

The process of dismantling the space-age greenhouses of Sprung Enviroponics in south-east Calgary began Monday.

Company president Phil Sprung Sr. said the structures are being moved in Newfoundland in order "to stay alive," signalling the end of this long-term dream of establishing up to 20 of the giant hydroponic vegetable gardens in and around the city to serve the Alberta market.

Meanwhile in Edmonton, Economic Development Minister Larry Shaben said he is discussing incentive to keep Sprung operating his greenhouse company in Alberta.

Under a preliminary agreement, the province [of Newfoundland] will provide $3.5 million in equity, $2.5 million in cash advance, a $7 million loan guarantee, $9,000,000 in sales-tax exemptions and serviced land worth $1 million.

The Sprung Group of Companies will contribute $3.5 million towards the project.

Shaben refused to say whether enticements similar to those offered by Newfoundland are under consideration to keep Sprung greenhouse operating in Alberta."

CASE STUDY 2: The Western Noodle Story

Information Package

WESTERN NOODLE - NEW INDUSTRY FOR WESTERN CANADA

The following is a transcript of an interview with Mr. Jim Hampson, Chairman of the Board of Directors, Western Noodle Corporation. This corporation was recently formed by a group of farmers with a problem: "How would they market the unsold grain on their farms when the demand and prices are so low?"

The solution to their problem was the answer to another problem: "What could be done to save a Saskatchewan business from closure?"

Interviewer: First of all, what is Western Noodle and what type of product do you make?

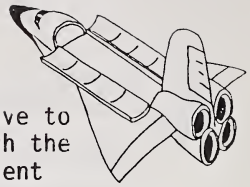
Mr. Hampson: Western Noodle is a corporation which was formed by the farmers of Cutknife, Saskatchewan. We make 14 different kinds of products from macaroni to lasagna noodles. These products also go to different businesses. For instance, we make special noodles for use in Chinese Restaurants. But it's generally a product for all people.

Interviewer: Where did the idea come from and how did the company start?

Mr. Hampson: The idea came from the Small Business and Tourism Branch of the Saskatchewan Government out of Saskatoon. The people of Cutknife have been quite aggressive in getting business (for our area). An official of the Tourism Branch phoned the Mayor of Cutknife to say that this business was available. It had been owned by a Chinese fellow, and operated for 17 years, but was not in financial difficulty. What we did was to offer shares to people in the Cutknife area. Forty five farmers obtained shares at this time. Out of that group a 6 man Board of Directors was elected. I was elected as Chairman of that Board.

Our first objective is to establish markets (for the product) and then to move the plant to Cutknife, if we can get around a small problem with the wheat board. There is a two price system of grain. It is hoped that since this will be a farmer-owned plant, we can sell our own grain to our own operation.

[Note: The two price system means that the farmer receives an average price for his grain when sold to the Wheat Board. However, domestic consumers (Canadians) pay about $7.00 per bushel for grain and Foreign Consumers pay only about $3.00 per bushel (or whatever world market price can be obtained). In order for farmers to



receive the higher price directly, they would have to sell directly to themselves without going through the wheat board. This is not allowed under the present system.]

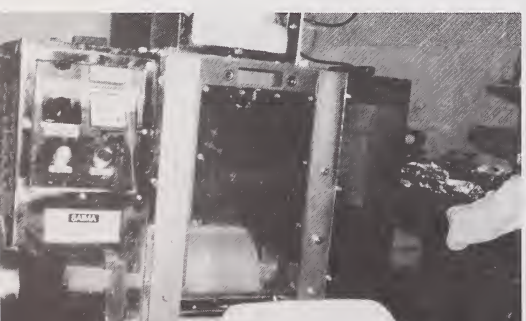
Interviewer: I believe you have a problem with storage of surplus grain to begin with. Has this enterprise helped you to solve your problem?

Mr. Hampson: We are hoping to (find a solution). There is a similar plant in North Dakota that employs 170 people and processes 2000 bushels of wheat per day. You can see why we got a little excited when we were presented with the idea.

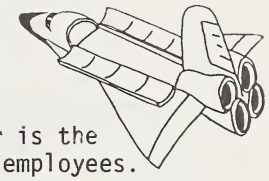
(At present) we are still in a growth stage. We want to establish this company in the markets real well, get a good strong market before we build a 2 or 3 million dollar plant out here in Cutknife. (The present plant is located in Saskatoon). Instead, we have leased the building form SEDCO (from the Saskatchewan Economic Development Corporation) so we do not have money tied up in a building. We bought the machinery, also from SEDCO, for a reasonable price.

Interviewer: How much grain are you able to sell to the corporation?

Mr. Hampson: Right now we are not selling any. We buy from a local (Saskatoon) flour mill. In the future, we hope to haul grain. Right now we can not legally haul grain, get it milled, and use the flour. We will first have to deal with the wheat board. Our idea is to mill our wheat at the $7.00/bushel domestic price rather than sell to the wheat board at the $3.00/bushel export price.



A roll of lasagna dough.



Interviewer: Is the Cooperative operated by it's members or is the work involved in daily operation performed by employees.

Mr. Hampson: The company is totally operated by employees. We have a General Manager and 12 to 14 employees.

Interviewer: Is the company pretty well self-supporting?

Mr. Hampson: Not at this time. We hope to be pretty close in the next few months. We have a number of legal problems to be looked at which is often the case taking over another company.

Interviewer: What are the responsibilities of the shareholders for sharing of expenses and profits. Do the shareholders contribute the money to meet expenses?

Mr. Hampson: Yes, the shareholders feel strongly enough about the company that they are willing to back it with more money. They do not want to sell more shares (to raise money) so they meet expenses among themselves. We have also tried to avoid borrowing money.

Interviewer: How do you market your product and where it is sold?

Mr. Hampson: We market the product through brokers. They act like salesmen for us, if you wish. They sell it (the products) to the wholesalers, and they, in turn, market to retail stores. It's marketed under the Western Noodle brand name.

Interviewer: Do you sell all over Canada?

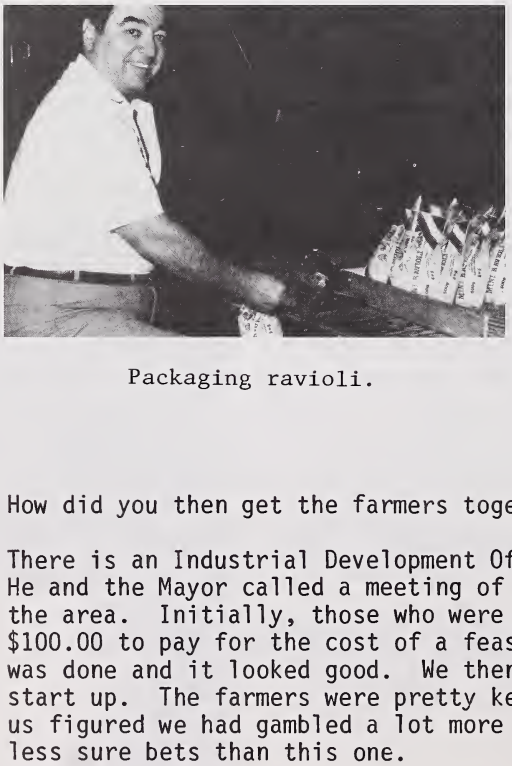
Mr. Hampson: The company wasn't marketing all over Canada when we took it over. Now we market (mainly) in Alberta, and Saskatchewan. We are setting up a broker in Manitoba and another in Toronto. We also have a broker in Halifax who is doing the Maritimes. We have another company in Vancouver who market our product under another brand name after we bag it for them. We also export to the United States. There is a fellow in Edmonton who handles exports to the United States (for a major Retail chain store). So far we have sold 1700 cases to California in 235 stores there. We also have a broker in North Dakota working on it (selling our product). In fact, he is in Mississippi at this moment trying to sell.

Interviewer: Does the low value of the Canadian dollar make you pretty competitive in the United States (by making Canadian products cheaper)?

Mr. Hampson: Yes that is a big help. The other help is that, when we export across the border, the Wheat Board reimburses us so much per pound of flour and we get money back. For instance, we pay about $20.45 per bag of flour. When we export (a produce made from the flour) the wheat board credits (our account) with the flour company about $15.00 per bag. [Note: This means exported flour costs Western Noodle only $5.00 per bag!]

Interviewer: As you mentioned earlier, it was the Saskatchewan government who originally asked you if you would like to take over the business? Did you receive any financial help from the government?

Mr. Hampson: We got advice, but no financial help from the government. They are a good outfit to work with. They have a lot of information on marketing. Our contact in the Tourism Branch has this information at his fingertips. With a little knowledge, you can win the day. They headed us in the right direction on the few times we needed advice. For instance, he had some good information for us on exporting. He had also been involved in helping the fellow who owned the business before us.



Packaging ravioli.

Interviewer: How did you then get the farmers together?

Mr. Hampson: There is an Industrial Development Officer in Cutknife. He and the Mayor called a meeting of the farmers around the area. Initially, those who were interested put in $100.00 to pay for the cost of a feasibility study. This was done and it looked good. We then raised $180,000 to start up. The farmers were pretty keen on it! A lot of us figured we had gambled a lot more money away on some less sure bets than this one.

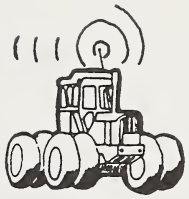
Interviewer: In your opinion, is there a future for other small food processing industries in Western Canada?

Mr. Hampson: I think so. A lot of things (could happen). For instance, now, this is not a small company by any means but it is farmer owned. The Saskatchewan Wheat Pool purchased a big share out at [local donut company] in order to sell them the flour. I think that was likely a smart move. They are larger than we are for sure but I can see an opportunity for smaller companies.

Interviewer: Would you recommend this type of approach to other small producers in a similar situation?

Mr. Hampson: It's a bit premature to give advice to other people. Our projections are for a profit within 6 months. Once we recover our start up expenses, things should be looking pretty good!

Activity 14



SEEING WITH EYES OF ENTERPRISE

Objective: In this activity your students will identify problems that affect them and then look for ways in which the situation can provide an opportunity.

Curriculum Fit: Grade 9, Topic A or Topic B
Canada: Industrial Development
U.S.A.: Industrial Development

Lesson Concepts: Individuals influencing industrial development

Quality of life and utilization of resources

Agriculture Concepts: Diversity of agriculture
Production, processing and distribution system

Cognitive Level: Analysis, Synthesis, Application

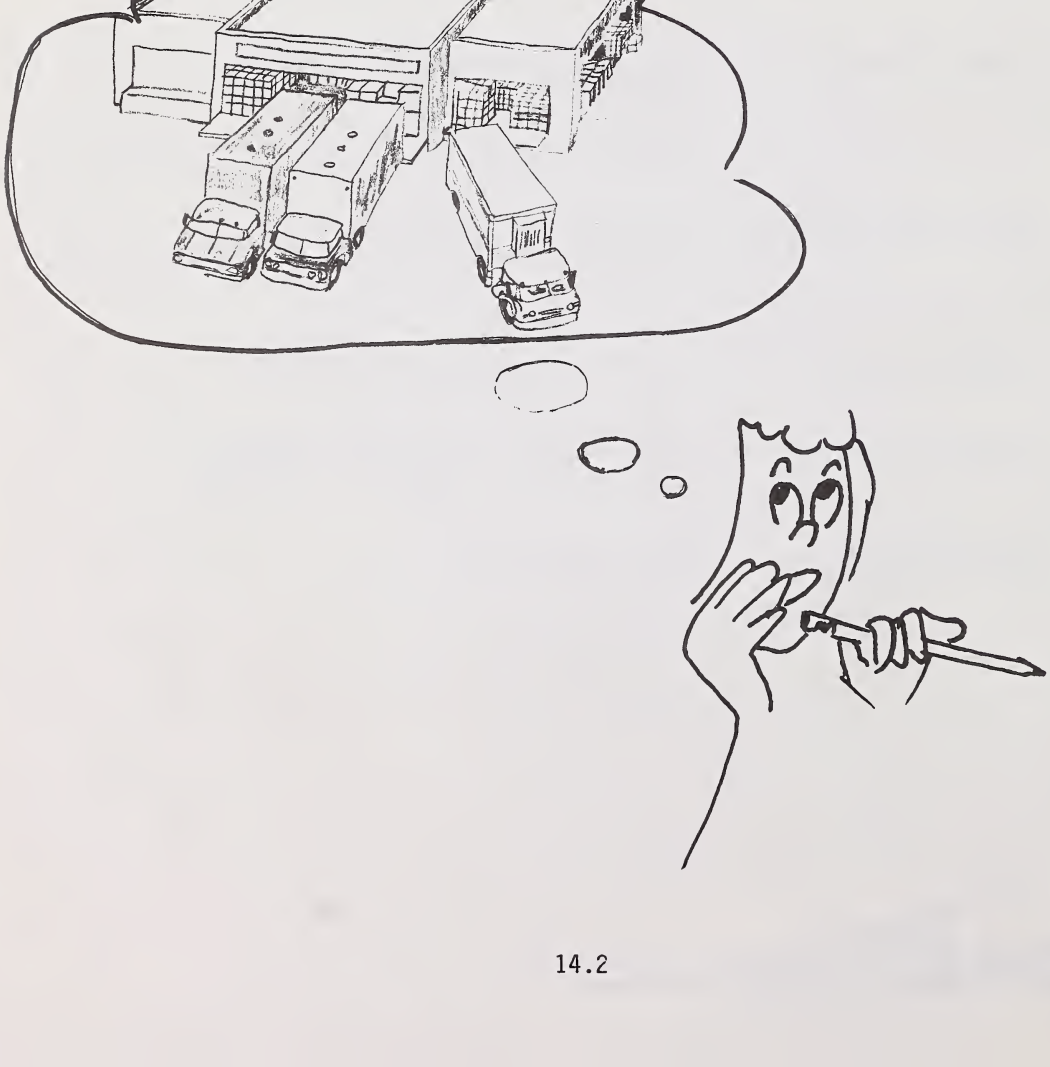
Materials Required: Imagination - supplied by students
Paper and pen - supplied by students

Time Required: One class period

BACKGROUND - To the Teacher

Frequently, a problem for one person can represent an opportunity for someone else. Likewise, a situation seen as a problem can also be seen as a solution if viewed from a different perspective. This lesson asks your students to practise this shift in perspective.

The procedure described here is a simple one and only aims to identify alternate ways of viewing a situation. However, your class may generate ideas that they can follow up as real-world proposals. This will provide an opportunity to develop participation skills in group decision-making and problem solving.



PROCEDURE

Part 1

Introduction:

1. In a class discussion ask your students to

   a) make a list of problems that they can identify in your school or classroom.
   b) examine the list for related problems.

Part 2

2. Divide the class into 3 or 4 task groups and ask each one to try to solve a selected set of related problems by looking at problems as situations that can be turned into opportunities. (You may have to review the Sprung Hydroponics articles from Activity 13.)

   E.g. Problem: poor attendance at sporting events
   Problem: lack of lunchroom facilities

   Solution: hold athletic events in the Gym at lunch.

Part 3

Conclusion:

3. Ask each group to present its solution proposal to the class. Questions and opportunities to follow up will depend on the proposal.

FOR DISCUSSION

1. Why is this event a problem where it is happening?

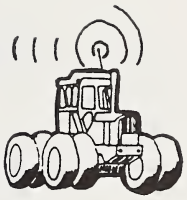
2. In what situation might this problem event be useful?

3. How can this event be transferred from its' present situation to the opportunity situation?

RELATED ACTIVITIES

Any of the problems that your students identify may serve as springboards to a real world project for them to pursue.

Activity 15



VEGETABLE GLITZ

Objectives: Beginning with a hypothetical situation, students develop a marketing scheme for an agricultural product.

Curriculum Fit: Grade 9, Topic A or Topic B
Canada: Industrial Development
U.S.A.: Industrial Development

Lesson Concepts: How individuals influence industrial development

The role of government in Canada's industrial development

Participate in group decision-making by assuming a specific role in preparing a group report

Agricultural Concepts: Diversity of agriculture
Production, processing and distribution system
Economic importance of agriculture

Cognitive Level: Analysis, Synthesis

Materials Required: These will vary with the ideas students pursue. They will have to arrange for what they need.

Time Required: Two class periods

BACKGROUND - To the Teacher

Suppose that you are presented with the task of creating, processing and marketing a new product. How would you go about it? That is the central issue of this activity.

Over the last two lessons you have illustrated the entrepreneurial mind set to your students and asked them to apply it to situations that directly affect them. Now they are to apply the same approach to an agricultural subject.

PROCEDURE

Part 1

Introduction:

1. Working with the whole class, ask students to imagine that you are a small Alberta vegetable processor and you would like to expand your plant and increase the market for your vegetables. Tell them that they are to come up with ideas for you to use in this expansion.

Part 2

The Activity: (Ideas)

2. Lead the class in a brainstorm in which they try to think of new products that you could make out of vegetables. You should take on the role of idea recorder for this session.

Rules for Brainstorming

a) Everyone must contribute ideas.
b) All ideas are to be recorded, no matter how bizarre or ridiculous the idea may seem at first. Eg. salt and vinegar beet chips.
c) No one is allowed to make fun of or criticise another person's ideas.
d) Participants now build or enlarge on another person's ideas.

Continue until you have a dozen or more suggestions.

(Selection)

3. Divide the class into task groups and ask each group to choose one of the products of the brainstorm session. Allow them five minutes to decide.

(Project)

4. Allow each group to do a preliminary market survey. If their product were available count hands to determine how many in the class would be willing to:

   a) eat the product daily?
   b) eat the product weekly?
   c) feed it to their family?
   d) offer it to their friends at a party?

   Find the total score for each idea.

Part 3

Conclusion:

5. Have each group prepare a display to introduce their product to the public.

6. Conduct a survey or test their product in the school.

CHECKPOINTS FOR SUCCESS

Ensure that your task groups include the following in their figuring.

a) Examine the statistics provided in data sheets 1 and 2 to determine:

- which provinces have the highest population (and therefore the largest potential market).
- which province has the highest production of your vegetable (and most likely the lowest possible production costs).
- if your vegetable is produced in Alberta.

Use other resources if necessary to find this information.

b) The majority of food processing industries and largest markets are located outside Alberta. This may create problems for your business.

- What are these problems?
- How might these problems be overcome?
- In what ways could we use government assistance?

c) Write a brief description of the expected demand for your product.

Include:

- Where would the raw materials come from?
- Where would the product be processed and packaged for distribution?
- Where would the finished product be consumed?
- How will we pay for transportation to markets?
- How much would you estimate that you could sell in one year to Canadians (use per capita consumption and population statistics)?
- How could we increase the size of our market?

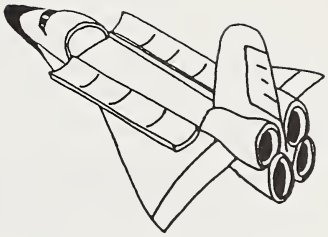
d) Construct a flow chart for production, processing, marketing, and distribution of the product. It must show the essential steps required from raw material to finished product in the hands of the consumer.

e) Include the following:

- Think of an original name for the product.
- Write a jingle or create a slogan to help consumers remember your product.
- Select a method of packaging.
- Design a logo label for your container.

f) Prepare a display to introduce your product to the public.

g) Conduct a survey or test your product in your school.



DATA SHEET 1

Population for Canada
The Provinces and Territories

(estimated as of January, 1987)

Canada	25,748,000
Nfld.	579,500
P.E.I.	128,200
Nova Scotia	887,600
N.B.	721,200
Quebec	6,657,700
Ontario	9,273,300
Manitoba	1,082,500
Saskatchewan	1,021,700
Alberta	2,386,300
British Columbia	2,926,200
Yukon	23,000
N.W.T.	50,100

Sources: Quarterly Estimates of Population for Canada, the Provinces and Territories (91-001). Statistics Canada

DATA SHEET 2

Production Area of Selected Vegetables, 1986

tables ted area tares)	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Ab.	B.C.
ragus	2,241	--	--	--	--	450	1,722	32	--	--	217
s	1,127	--	5	117	30	635	256	8	--	29	47
age	..	..	69	235	154	2,850	1,882	154	--	212	346
ots	..	..	101	595	101	4,430	2,310	113	--	348	246
iflower	3,304	--	11	105	182	925	1,518	x	--	43	520
mbers	3,391	--	32	40	49	1,151	1,906	28	--	111	74
uce	2,203	--	22	45	28	1,390	477	--	--	--	241
ns	3,741	--	--	--	--	990	2,357	158	--	--	152
toes	116,427	202	28,328	1,659	20,639	19,789	14,852	17,280	1,052	9,308	3,318
bagas	..	..	210	162	223	1,100	1,308	49	--	56	122

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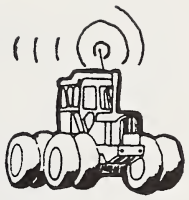
ce: Farm Facts. 1987, Statistics Canada

UNIT VI: INTERNATIONAL TRADE

In the modern world any country's industrialization depends on trade with other nations. In Activity 16, which makes up all of Unit VI, your students role play the activity of nations trading.

Through the simulation activities they carry out, students will experience many of the principles of market economics.

Activity 16



THE WORLD TRADING GAME

Objective: This lesson gives your students a concrete experience in trading commodities. Students will represent different countries, each with a few commodities to trade. Their goal will be to obtain the greatest possible variety of goods at the best possible price. During bargaining and trading, students will experience free trade and a variety of trade restrictions. This will provide a good background for discussion of these issues in class.

Curriculum Fit: Grade 9, Topic A or Topic B

Canada: Industrialization or
U.S.A.: Industrialization

Lesson Concepts: The importance of trade to the development of industry

The effects of free trade and protectionism on trading activities

Agriculture Concepts: Economic importance of agriculture
Capital and technology intensity
Diversity of agriculture

Cognitive Level: Comprehension, Application

Materials Required: Reproductions and class sets of background information, trading cards, currency vouchers, and game rules

Time Required: 1 class period to present and discuss the background information on trade

1 class period to play the game and to discuss the results

BACKGROUND - For the Teacher

When industrial development began it was driven by the fact that industrializing countries had demand for goods and services that they could not supply without industrial technology. As the technology base grew until production could exceed demand, international trade became more and more important to industrial nations. This has now reached the point where all economies must export goods and services in order to keep their economies running near capacity.

In the Trading Game, your students will attempt to maximize benefits to themselves. Once they have done so under a variety of trade regimes, they will have an opportunity to discuss the results.

PROCEDURES

Part 1

Preparation:

1. To prepare for this activity, make class sets of the following:

   - trade - an information sheet.
   - trading cards. Make 3 to 4 copies of 10 to 18 countries (depending on your class size - see list of countries and products).

   NOTE: There are two countries on each master and two products per country.

   - currency vouchers. Make 1/2 sheet for each member of the class.
   - extra wheat cards (may need 1 sheet only).
   - rules of the game.

Part 2

Introduction:

On the first day,

2. Distribute the background material, TRADE - an information sheet, to your class. This material is located at the end of this lesson.

3. Use the questions provided to guide a class discussion of the information on trade.

Part 3

The Game:

On the second day,

4. Distribute and explain the rules of the game. Two winners will be chosen: one with the maximum number of different products in the shortest possible time, and one with highest total value of trading cards and currency.

5. Distribute the trading cards and currency vouchers. Give each student two sets of 8 trading cards and 1/2 sheet of currency vouchers.

6. Inform the class that you will act as the "Government" to help distribute subsidies and collect tariffs.

7. Assign two students for each country listed at the top of the trading card set. The cards represent products they have to trade. Students should select a location in the classroom as a base from which to trade. They may wish to use the chalkboard or a folded paper display to advertise the commodities they wish to trade or those they require.

8. Countries may begin trading cards to obtain the complete set products as soon as possible and as cheaply as possible.

9. Schedule short 3 minute recesses after each 5 minutes of trading so that students of each country can see how they are progressing and plan for the next trade session.

10. End the game when one country collects the maximum number of different products.

11. Tabulate the results for each country.

    a) Ask each country to determine the number of different commodities that they have accumulated. List results on the blackboard.

    b) Next, determine the trade balance by subtracting the final total value of trading cards plus cash vouchers from the starting total value. (Each country started with 3,200,000 Units of trading commodities and 80,000 Units of cash vouchers for a total of 4,000,000 Units). List final Balances of Trade on the Blackboard.

c) Game winners, as well as 2nd, 3rd place countries, will be revealed by the tabulated data.

Part 4

Conclusion:

12. Answer the discussion questions provided.

13. Discuss trade strategies. Was any particular approach more successful than others?

FOR DISCUSSION

1. Did the country with the greatest diversity also have the most favourable trade balance? Would this situation be able to continue in the "real" world? What could be done to improve this country's balance of trade?

2. Did the country with the most favourable trade balance also have the greatest diversity? Would greater diversity eventually occur if the game were allowed to continue?

3. How did you feel about trading in commodities with trade restrictions? What was the effect of restrictions on trade in those cards?

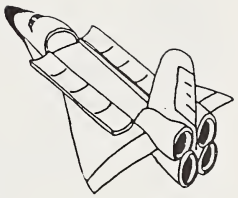
4. Do quotas seem like a fair restriction on your trading? What reason might be given for a quota on imports? How do quotas hurt nations who wish to export?

5. Are price cartels effective on maintaining prices? Why did they (not) work?

6. Certain cards had no trade restrictions. Did these cards become more or less important as the game progressed? In what way? Does this demonstrate anything about free trade?

RELATED ACTIVITY

1. Invite a guest speaker to tell the class about export trading.



PLAYING THE GAME

Objectives:

The objectives of this game are:

1. to obtain the greatest variety of trading commodities in the shortest possible time

2. while showing a positive trade balance.

Two countries will emerge as winners. One will have the greatest number of commodities and the other most positive trade balance.

Strategies:

1. Success in this game depends on interaction and trade.

2. Protectionism is a means of restricting trade. Remember this as you trade.

3. By controlling supplies of a commodity you can control pricing.

Role of the Government:

1. Distribute subsidies on wheat to be given to the importing country when traded.

2. Collect tariffs from countries during trading. Also, collect fines if you see anyone trying to escape tariff payments. The fine for failure to pay a tariff is the full value of the card(s) being imported.

3. Enforce Quotas. Any cards in addition to a quota card have no value when the final count is made.

4. Conduct a recount at the end of the game if there is a dispute over who is the winner.

RULES OF THE GAME

1. The values of commodities are given as cash "units". You may trade commodities of equal value or bargain for those commodities that are in short supply using combinations of commodity cards and cash vouchers.

2. Special rules are given at the bottom of some cards. These rules are based on actual government influences on trade (with some modifications for the purpose of this game). In this case, the rules describe the conditions which affect trades involving the specific cards. They must be obeyed just as in the real marketplace. The following is a summary of the special rules:

   Tariffs - have been set at 20% of the value of the commodity being traded. Tariffs are payed to the "Government" by the importing country. If you are reported not paying a tariff, you may be fined the total value of the cards imported.

   Wheat subsidies - Wheat cards are traded with a subsidy attached. Pick up your subsidy from the "Government". Give the subsidy to the other country when you export wheat. You may also buy more grain cards from the "Government" with currency vouchers for use in further trades.

   Quotas - The maximum amount of this commodity which you can own or import will be determined by the highest quota card in your possession. Extra cards held by a country will have no value except for the country of origin.

   Price Cartels - You may not bargain for this card but must trade for cards of equal value.

3. You will have a three minute recess from trading after each 5 minute trading session. Use this time to organize your cards and plan a strategy for the next session of trading.

4. When you have collected the maximum number of commodities you may call a halt to the game. The maximum number will be specified by the teacher.

5. At the end of this time determine the number of different commodities that you have been able to obtain and calculate your balance of Trade.

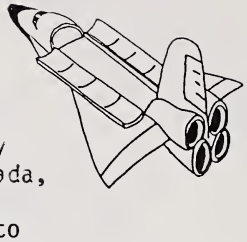
A List of Countries and Trading Commodities Used in This Game

	Country	First Product	Second Product
1.	Canada	Lumber	Wheat
2.	Australia	Livestock	Wheat
3.	Japan	Computers	Cars
4.	U.S.A.	Aircraft	Cars
5.	European Economic Community (E.E.C.)	Processed Foods	Wheat
6.	U.S.S.R.	Iron Ore	Oil
7.	Mexico	Poultry	Tropical Fruit
8.	Saudi Arabia	Oil	Tropical Fruit
9.	United Kingdom	Tea Bags	Woolen Goods
10.	Ireland	Potatoes	Woolen Goods
11.	India	Tea	Shoes
12.	Philippines	Clothing	Shoes
13.	Ghana	Cocoa Beans	Sugar
14.	Brazil	Coffee	Sugar
15.	People's Republic of China	Rice	Armaments
16.	France	Wine	Armaments
17.	S. Korea	Televisions	Clothing
18.	Italy	Clothing	Cars

When all 18 countries are included in the game there are a total of 26 different trading commodities. Each country will have 32 cards in two commodities with which to trade. (4 copies of each master).

If only 12 countries are used there will be 17 trading commodities. Reduce the number of trading cards per country to 24 if 12 or fewer countries are used. (3 copies of each master.)

Each country will normally be represented by 2 students.



TRADE - an information sheet

Trade between nations and the ability to export are key ingredients for the economic success of all countries. Canada, for instance, sells almost 50% of what it produces to other countries. This brings money into this country which helps to raise our standard of living.

Exports

Exports are goods or services which are sold to other countries. Exporting is beneficial in a number of ways.

Exporting allows an industry with a small local market to take advantage of large scale production. Producers can then increase their income to help pay for machinery, mass production facilities, and the research and development of new products. This is called an economy of scale. High levels of production create high levels of employment.

Exporting also allows a small country to become very effective in the production of a limited number of commodities. This is referred to as specialization. Specialization enables the country to achieve a production surplus, an amount greater than it needs, for trade to other countries. Canada has traditionally been a major exporter of forest products, wheat, and raw materials. We are at the same time a major buyer of processed and manufactured goods.

Changes in markets for certain commodities mean that new products and services, more efficient production methods, and imported marketing strategies are continually needed to maintain export markets. For example, specialty crops such as Canola (a vegetable oil seed) are beginning to replace wheat production on many Canadian farms; researchers are now developing a soybean which will grow well in our climate; the use of robots is expected to increase in manufacturing and food processing industries. The demands of consumers for higher quality and lower cost are also influences for change.

Imports

Imports are goods and services which we buy from other countries. It is difficult for any country to produce everything that it needs or wants. By importing, we can obtain items not produced in our own country (such as coffee) or obtain goods more cheaply than we could produce them ourselves (such as machine parts of electrical components).

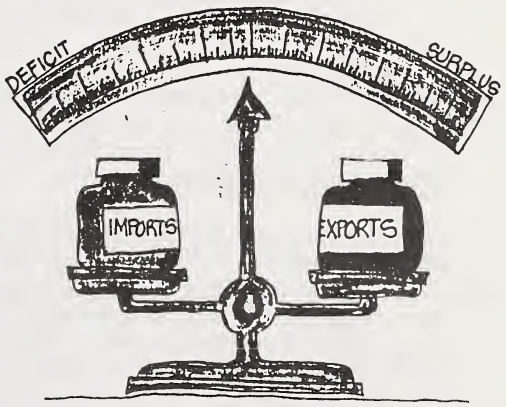
Frequently, goods are imported in direct competition with the same products produced within a country. This is not necessarily bad. Competition motivates people involved in industry to develop new products, improve quality, and reduce the cost of production. These efforts benefit the consumer.

Balance of Trade

The balance of trade is the difference in dollar value between all exports and all imports. For example, in 1983

	Canada's Total Exports	90,964,000,000
Less	Canada's Total Imports	75,587,000,000
	Gives a Trade Balance of	15,337,000,000

A positive balance of trade is desirable. It means that more goods are leaving the country than are entering and, therefore, there is a new flow of money into the country. This situation is referred to as a **trade surplus.**



A negative balance of trade is called a **trade deficit.** In this case the value of imports is greater than the value of exports. This situation produces a new flow of money out of the country. Less money is then available for local investment and the whole economy suffers.

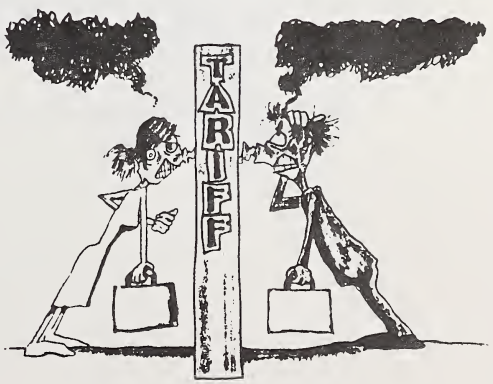
When a country is faced with a trade deficit, it must reduce its imports or increase its exports.

What are some economic effects of a negative balance of trade?

Protectionism

Competition is often resented when markets are lost to superior or less expensive imported products. A negative trade balance may occur. In this case, competition is seen as creating unemployment and a loss of income.

Protectionism is a way of restricting trade to reduce imports and the flow of money out of the country. Countries may do this if they feel that local jobs can be protected. Protectionism is seen as unfair by those countries that have enjoyed incomes from markets which are now closed or limited.



The following are a few forms of protectionism which might be used.

1. Tariff Barriers require that a duty (tax) be paid to the government by the person or company who imports an item. This sum is usually equal to a percentage of the total value.

2. Quotas put a limit on the amount of an import allowed.

3. Embargos place a ban on bringing certain imports into a country.

4. Customs clearances, import licences, and quarantines are designed to create delays and inconvenience for importers.

Types 2, 3, and 4 are often called non-tariff barriers. What are alternatives to protectionism to help reduce imports?

Government Subsidies

One way to make your products more competitive for export is through the use of government subsidies. Subsidies usually involve a cash payment, given to producers, to help meet production costs. They are also used to help new industries get started. Unfortunately, this practice often forces other countries to subsidize their industries as well, in order to remain competitive.

Government subsidies are currently a major problem for the world grain market. Wheat subsidies were first used in Europe to help producers remain profitable when faced with falling world prices, to increase the size of their export market, and to provide inexpensive raw materials for food processing industries. This action has led other countries to do likewise. Subsidies are paid with tax revenues or by borrowing from banks and other financial institutions. This places a heavy financial burden on a country, encourages unnecessary production by farmers who collect subsidies, and creates a worldwide surplus of wheat.

Canada is one country caught in the subsidy trap. We have a small population base for taxation and our government is unwilling to borrow more money for higher subsidies to farmers. For this reason, Canada's grain farmers are facing difficult times.

What are some alternatives for Canada's wheat farmers?

Price Fixing and Pricing Cartels

Another way of reducing competition is by fixing prices. This requires an agreement among countries which control supplies of a commodity. A group of producing countries called a **cartel** may agree to fix prices at a high level. Cartels are difficult to maintain as high prices encourage greater production and create many opportunities for new markets among those countries willing to sell below cartel prices.

What conditions are required for a price cartel to be effective?

Free Trade

Free trade is a concept where trade is conducted without government interfering in the marketplace. Market prices are determined totally by supply and demand. It is argued that free trade will create a better world economy through increased trade and unrestricted competition.

There are, however, many concerns over special trade advantages enjoyed by some countries, lack of access to markets in other countries, and opportunities for exploitation of any country by another. For this reason the reality of free trade is part of a complex process of negotiation.

What are a few of the advantages of free trade between the U.S.A. and Canada for both sides?

What are a few of the disadvantages of free trade between the U.S.A. and Canada for both sides?

PRODUCT OF :
JAPAN

100,000 UNITS

Cars

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
JAPAN

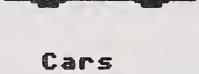
100,000 UNITS

Cars

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
JAPAN

100,000 UNITS



Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
JAPAN

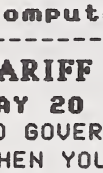
100,000 UNITS

Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
JAPAN

100,000 UNITS

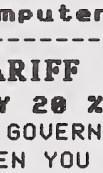


Computers

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
JAPAN

100,000 UNITS

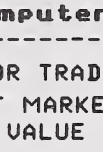


Computers

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
JAPAN

100,000 UNITS

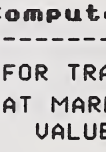


Computers

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
JAPAN

100,000 UNITS

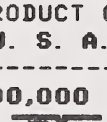


Computers

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS

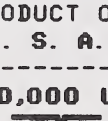


Aircraft

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS

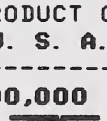


Aircraft

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS

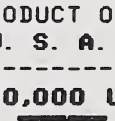


Aircraft

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS



Aircraft

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS

Cars

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. S. A.

100,000 UNITS

Cars

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. S. A.

100,000 UNITS

Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. A.

100,000 UNITS

Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
E. E. C.

100,000 UNITS

Processed
Foods

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
E. E. C.

100,000 UNITS

Processed
Foods

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
E. E. C.

100,000 UNITS

Processed
Foods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
E. E. C.

100,000 UNITS

Processed
Foods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
E. E. C.

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :
E. E. C.

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :
E. E. C.

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :
E. E. C.

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :
U. S. S. R.

100,000 UNITS

Oil

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. S. R.

100,000 UNITS

Oil

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. S. R.

100,000 UNITS

Oil

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. S. R.

100,000 UNITS

Oil

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. S. S. R.

Iron Ore

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. S. S. R.

Iron Ore

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. S. S. R.

Iron Ore

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
U. S. S. R.

Iron Ore

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Poultry

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
MEXICO

100,000 UNITS

Poultry

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
MEXICO

100,000 UNITS

Poultry

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Poultry

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
MEXICO

100,000 UNITS

Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

Oil

PRICE CARTEL
IN EFFECT.
TRADE ONLY FOR
EQUAL VALUE.

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

Oil

PRICE CARTEL
IN EFFECT.
TRADE ONLY FOR
EQUAL VALUE.

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

Oil

PRICE CARTEL
IN EFFECT.
TRADE ONLY FOR
EQUAL VALUE.

PRODUCT OF :
SAUDI ARABIA

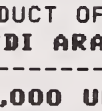
100,000 UNITS

Oil

PRICE CARTEL
IN EFFECT.
TRADE ONLY FOR
EQUAL VALUE.

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

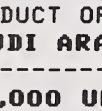


Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

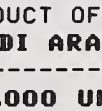


Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS

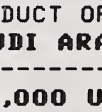


Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
SAUDI ARABIA

100,000 UNITS



Tropical Fruit

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. K.

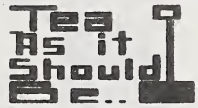
100,000 UNITS

Tea Bags

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. K.

100,000 UNITS

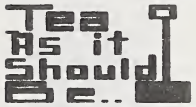


Tea Bags

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
U. K.

100,000 UNITS

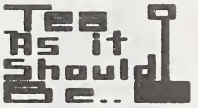


Tea Bags

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. K.

100,000 UNITS



Tea Bags

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
U. K.

100,000 UNITS

Woollen Goods

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
U. K.

100,000 UNITS

Woollen Goods

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
U. K.

100,000 UNITS

Woollen Goods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
U. K.

100,000 UNITS

Woollen Goods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
IRELAND

100,000 UNITS

Potatoes

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
IRELAND

100,000 UNITS

Potatoes

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
IRELAND

100,000 UNITS

Potatoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
IRELAND

100,000 UNITS

Potatoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
IRELAND

100,000 UNITS

Woollen Goods

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
IRELAND

100,000 UNITS

Woollen Goods

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
IRELAND

100,000 UNITS

Woollen Goods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
IRELAND

100,000 UNITS

Woollen Goods

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
INDIA

100,000 UNITS

Tea

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
INDIA

100,000 UNITS

Tea

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
INDIA

100,000 UNITS

Tea

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
INDIA

100,000 UNITS

Tea

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
INDIA

100,000 UNITS

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
INDIA

100,000 UNITS

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
INDIA

100,000 UNITS

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
INDIA

100,000 UNITS

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Clothing

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Clothing

TARIFF
PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Shoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Shoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
PHILIPPINES

100,000 UNITS

Shoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PHILIPPINES

100,000 UNITS

Shoes

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

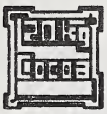
100,000 UNITS

Cocoa Beans

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

100,000 UNITS



Cocoa Beans

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

100,000 UNITS

Cocoa Beans

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

100,000 UNITS

Cocoa Beans

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

100,000 UNITS

Sugar

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
GHANA

100,000 UNITS

Sugar

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
GHANA

100,000 UNITS

Sugar

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
GHANA

100,000 UNITS

Sugar

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Coffee

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Coffee

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Coffee

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Coffee

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Sugar

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
BRAZIL

100,000 UNITS

Sugar

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
BRAZIL

100,000 UNITS

Sugar

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
BRAZIL

100,000 UNITS

Sugar

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

Rice

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

Rice

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

Rice

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
PEOPLE'S REP. OF CHINA

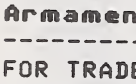
100,000 UNITS

Rice

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

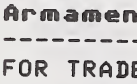


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

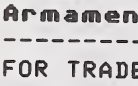


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
PEOPLE'S REP. OF CHINA

100,000 UNITS

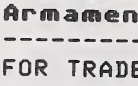


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
PEOPLE'S REP. OF CHINA

100,000 UNITS



Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

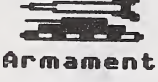
100,000 UNITS

Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

100,000 UNITS

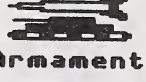


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

100,000 UNITS

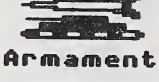


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

100,000 UNITS

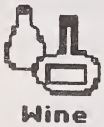


Armaments

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

100,000 UNITS



Wine

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
FRANCE

100,000 UNITS

Wine

QUOTA
IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
FRANCE

100,000 UNITS

Wine

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
FRANCE

100,000 UNITS

Wine

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
S. KOREA

100,000 UNITS

Televisions

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
S. KOREA

100,000 UNITS

Televisions

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
S. KOREA

100,000 UNITS

Televisions

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
S. KOREA

100,000 UNITS

Televisions

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
S. KOREA

100,000 UNITS

Clothing

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
S. KOREA

100,000 UNITS

Clothing

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
S. KOREA

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
S. KOREA

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
ITALY

100,000 UNITS

Clothing

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
ITALY

100,000 UNITS

Clothing

TARIFF

PAY 20 % DUTY
TO GOVERNMENT
WHEN YOU IMPORT

PRODUCT OF :
ITALY

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
ITALY

100,000 UNITS

Clothing

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :
ITALY

100,000 UNITS

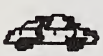
Cars

QUOTA

IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
ITALY

100,000 UNITS



Cars

QUOTA

IN EFFECT.
YOU ARE ALLOWED
A **MAXIMUM** OF
100,000 UNITS

PRODUCT OF :
ITALY

100,000 UNITS

Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF:
ITALY

100,000 UNITS

Cars

FOR TRADE
AT MARKET
VALUE

PRODUCT OF :

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

PRODUCT OF :

100,000 UNITS

ATTACH
20 % CASH
SUBSIDY
FROM THE
GOVERNMENT
WHEN YOU EXPORT

20,000 UNITS 20,000 UNITS 20,000 UNITS 20,000 UNITS

CURRENCY CURRENCY CURRENCY CURRENCY

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VOUCHER VOUCHER VOUCHER VOUCHER

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CURRENCY CURRENCY CURRENCY CURRENCY

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CURRENCY CURRENCY CURRENCY CURRENCY

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BOOK FOR TEACHERS DIVISION 3/

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DATE DUE SLIP

DUE EDUC FEB 21'89	
FEB 25 RETURN	
DEC 01'94	
RETURN NOV 16 '8	
RETURN JUL 28'97	

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